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RAILWAY PATENTS.

BY GEORGE G. FRELINGHUYSEN.

(Written for the AMERICAN RAILROAD JOURNAL.)

THE number of patents issued for Railway Appliances is so greatly in excess of the number of such appliances adopted by any of the many railways, that it has been a source of wonder to the on-looker as well as of discontent to the inventors and patentees.

An examination of the *Patent Office Gazette* for any week, will show from ten to twenty patents relating to railways and cars. The *Gazette* of June 3d shows fourteen such patents, of which six are for car-couplings. Accepting that as a fair average, we would have over three hundred different car-couplings every year. Of the six varieties published each week, probably not one of them would couple with any other, so that a road that should adopt any of them would have to transfer to other cars at the end of its route.

The brake inventions are the same in effect; each one starts on a new line, to make a new system, and should it be perfected and made most successful, it could not be introduced unless it was so much over and above anything before known or used, as to make it necessary for all the connecting roads to adopt it, even at the expense and confusion of an abandonment of the system then used by them.

The usual cry of the patentees of any railroad appliance is that they are too honest, that they cannot introduce their device without a "divide" with the president or superintendent, which they decline to make, and therefore suffer neglect.

If more of the patents covered improvements on the devices known, in the practical sense of the word "improvement," more of them would attract the attention of an ever appreciative public. In the very matter of couplings, why do men hover and wallow about making alterations, and as they claim, improvements on draw-heads for couplings, and a peculiar style of coupling-pin, and expect to reap a rich reward from the royalties thereon, when the public are free to use the excellent device of Miller, without charge. Miller's coupling is not perfect, and will doubtless be improved upon, but in its plainest and most imperfect form, it is much better than most of the devices for which claim is made in the numerous patents.

The inventors and patentees who are doubtless much disappointed that they are not immediately besieged by the railroad officials for the privilege of placing the devices disclosed in their last patent on all the railroads of the United States, should remember that letters patent are not granted as rewards to the favorites, as used to be the case, but are simply a grant of security for their inventions; and that the value of the patent depends on the value of the invention which the patent covers and the business ability and perseverance of the patentee. The general misunderstanding in this regard, leads many to follow after a shadow which they feel confident will give them fortune when it is once embodied in a patent. That patents have, and doubtless will be the means of securing great riches, is not my purpose to dispute, but I insist that in order to be of any value, they must cover a new and useful device, which is largely needed, or for which a large demand can be created, and must then be managed and pushed with business ability.

Inventions in railway appliances differ from most other inventions, in that it is impossible for the inventor to make any experimental trials of his invention, as few persons have private railways, or influence sufficient to gain permission to make the trial, even at their own expense, which is ordinarily heavy, and beyond the means of the inventor. This leads them to apply for and obtain patents for their inventions before testing them, which latter would, in many cases, have been sufficient to convince them of the impracticability of the devices patented.

The railroad world was not long in taking up the automatic couplings, the air brake, interlocking switches and improved frogs, not to mention the fish joints, heavy steel rails, and stone ballast. The trouble with the railway patents lies more in the poverty of invention shown by the patentees than in any lack of desire on the part of the managements for improvements, or disposition to rob the inventors of the fruit of their labor. An examination of some of the patents shows clearly that the invention is made for the sake of obtaining a patent, instead of the patent being obtained to secure the invention. This is such a prostitution of the Patent Act that there can be little wonder, and less pity that the patentees do not reap rich rewards therefrom. There is plenty of chance left for these inventive beings to reap a rich reward if they will only patent an invention instead of inventing a patent.

The couplings are not perfect; the brakes are not always to be relied on; air brakes will not "let go," quickly enough, and sometimes not at all, until the valve is opened by hand, and hand brakes are too slow, and expose the brakeman in case of accident.

There is no way of taking on coal without stopping. The heating appliances for cars are very imperfect; the ventilating arrangements, especially in cold weather, might be deemed not to exist, so far are they from being perfect. There are plenty of ways of roasting one's feet and having a draft about the head, or freezing the feet and heating the head, but to make a pure, warm, evenly distributed atmosphere in a car is unknown, or at least unpracticed.

The tracks, rail-joints, switches, frogs, ties and ballast; taking on and putting off baggage; storing and selling tickets; accommodating, assorting and directing passengers; receiving, handling and delivering freight in pack-

ages or in bulk, are all subjects capable of improvements, which would appeal to the pocket of the "soulless corporations," and be of advantage to the successful inventor, and a benefit to the public.

There is no use of trying to invent the Westinghouse brake again, nor the old-fashioned coupler, neither can the Miller coupler be revived, nor the Jennings appropriated.

So Messrs. Inventors do stop trying to get up the same things that have been so long known, with a variation too slight to be seen, and turn your thoughts to new fields, and make more than a colorable change, and you will not so often pay out your fees to the Patent Office as the only solace for your trouble and pains.

The numerous railway patents which never see the light of even an experimental use can only have the effect of discouraging those who see them, from trying to make advances in the same branch. Those who have *inventions* may be sure of having them appreciated, notwithstanding the contrary experience of the many patentees.

Remember that a patent only gives an exclusive right. It simply excludes all others from using the thing patented without paying or arranging with the patentee for so doing; and must be without value, unless the thing patented is such that others will elect to use it, and pay the license fee or royalties for the privilege.

CAUSES AND PREVENTION OF RAILWAY ACCIDENTS.

BY WM. S. HUNTINGTON.

(Written for the AMERICAN RAILROAD JOURNAL.)

THE first railways built in this country were seriously troubled with rail-joints. In keeping tracks in good condition the subject was the most difficult to handle. The rails were simply bar iron laid on longitudinal stringers of wood. To keep the ends of the bars in proper position was an utter impossibility. No matter how strongly they were spiked down, they were bound to curl or bend upward from the effect of rolling weight imposed upon them. The constant vibration pulled out the spikes, and soon the bars would assume the form of a section of wagon tire and were called "snake-heads." So long as the ends of the bars did not rise above the center of the wheels, no harm was occasioned except a dissagreeable rattling, but when the "snake-heads" rose above the centers, they would run upward through the bottoms of the cars and impale passengers after the manner of the sportsman who strings pigeons on the ramrod of his gun. In those days the lists of railway accidents were of a different character from the present. Then, a derailment from any cause was not attended with any serious results other than a little shaking up, a little delay, and a few bruises. The thing most to be dreaded was the murderous "snake-head." There was rarely any accident worth recording that did not come from this source, and people read these accounts with horror. It is difficult to conceive of a more terrible sight than the spectacle of several human beings writhing in agony with a bar of iron the size of a heavy wagon tire through their bodies, yet such was not an infrequent occurrence in those days. But with the advent of the T-rail there was an end of this class of calamity, and accidents assumed a different form. With the new rail came greater speed, and derailments and collisions headed the lists of railway disasters.

The first T-rails were laid without chairs. A broad cross-tie was selected for a joint-tie, and as the traffic was light this method was satisfactory for a time, but as heavier rolling stock became necessary, there was trouble at the joints, and chairs were introduced to prevent the end of the rails cutting into the tie, and the lamination and bending of the rails so that they would "set" in this form, ⌐¬, making every joint a hollow, which was very destructive to rolling stock and disagreeable to passengers. The chair was an improvement in some respects and an injury in others. While it kept the rails in place laterally, and gave more or less vertical support, it assisted the wheels in pounding and brooming the ends of the rails by reason of the greater solidity of the bearing. There was no end to the various styles and patterns of chairs, but none of them protected the ends of the rails from lamination, and after a short term of service several inches of the ends had to be cut off, or the rails taken from the track and carried to some shop where they were repaired by welding a piece of bar iron on the flattened ends and hammering into their original shape. Both methods of repair were expensive, and were the greatest difficulty with which railway companies had to contend. Millions of dollars were expended in this repairing, and hundreds of thousands in litigation over suits for infringing on patented devices for mending rails.

To give even a brief description of the various joint fastenings that have been introduced, would fill a volume of portly dimensions; and it will only be said here that, while some of them have more or less merit (mostly the latter), there are none that are entirely satisfactory. Chairs have been discarded in the main, and fish-bars are employed as a general rule. Some of these are very near the exact thing required, but there is no device yet in use that prevents the ends of the rails from wearing out, while the main part of the rail is capable of much longer service. What is wanted is a joint fixture that will preserve the ends of rails until the entire rail is no longer fit for service. A near approach to a perfect rail-joint is that which is now becoming known as "Gibbon's Boltless Rail-joint." This is the invention of Mr. T. H. Gibbon, an engineer of large experience, who has made the subject of rail-joints a study for many years. The Gibbon joint was illustrated in the JOURNAL of January last, and is becoming well known throughout the country.

Next in importance is a safe and reliable method of coupling freight cars. The danger attending the coupling of cars, the thousands that are killed or injured in the operation, and the seeming indifference of railway officials in the matter, have caused the legislative authorities to move in the direction of compelling railway managers to adopt some of the devices that have been brought out to prevent this class of accidents. It seems a little strange that a progressive people like the Americans should require the spur of the law to compel them to use such safety appliances as may be secured by a reasonable outlay, yet such is the case, and unless the railway community takes more lively interest in the matter than they have manifested heretofore, they will be forced to adopt such appliances as the railway commissioners may direct. It is well known that public officials are not always appointed by reason of their peculiar fitness for the position,

but through favoritism, and a board of incompetent railway commissioners might enforce the adoption of some inferior devices; whereas if railway experts and managers were allowed to select such appliances themselves, they would very likely secure meritorious devices that would be satisfactory. Among more than 3,000 patent couplers there are few, if any, that are satisfactory, and there is no coupling for freight cars equal to the old style of link and pin. The only objection is the danger attending its use. A train once coupled with the link and pin is the best train on earth, but as it is now operated it is a man-killer. The automatic couplers are objectionable on many accounts and it is safe to say that none of them yet named will ever come into universal use. The probability is that some simple and effective device for manipulating the link and pin, by which a coupling may be effected without the necessity of going between the cars, will constitute the coupler of the future. Among all the thousands of devices, patented and unpatented, one of the most simple and effective is the invention of Mr. Wm. S. Thayer of Owego, New York. This invention consists of a rod of round iron about ¾ inch in size and bent so as to form a crank-shaped lifter for the link. The device is readily attached to the end of the car, and so arranged that the operator stands outside and makes the coupling without going between the cars. This is not an automatic coupler, and in fact, is not a coupler at all. It is what the inventor calls an "Assistant Coupler," and is perfectly safe and reliable. It can be applied to any car at a merely nominal expense, as no changes are necessary as is the case with the general run of new devices which require a change of draw-heads at an expense of $40 or $50 dollars per car.

Another cause of many railway fatalities is that of people being caught in frogs and guard-rails and being held fast while run down by cars and locomotives. This class of accident is becoming alarmingly frequent, and railway managers are looking for an effective remedy for the evil. Several patents have been issued for devices intended to prevent such accidents, but a satisfactory foot-guard has not yet made its appearance. Wood blocking or filling has been tried on many roads, but that affords only a partial protection, and is an element of danger to trains and therefore should be discarded. As an instance of the unwise legislation that might result from the reluctance of railway officials to adopt safety appliances, it may be mentioned that two or three years since the legislature of Michigan enacted that every railway in the State should block all dangerous openings in frogs, guard-rails, and switches, with wood coming to within a half inch of the surface of the rail. It is obvious that the man who drew up the specifications of this bill knew nothing about the matter, and although the bill passed both houses, it did not receive the Governor's approval, and if it had it could never have been enforced for reasons that will be apparent to any one at all conversant with the matter. Rubber filling and steel springs have been tried, but were failures, and some roads are now trying a wood filling that is made to fit in the throat of the rail, and is bolted to the neck of the rail with carriage bolts. This plan fills the space under the rail-heads and leaves a V shaped opening in the flangeway, but it leaves a boot-jack opening at the entrance to frogs and guard-rails, and is only a partial protection. It is expensive to apply, as the rails must be drilled for the bolts, and moreover the wood is liable to split, get into the flangeway and cause derailment. It is altogether unsatisfactory. Probbably the best protection that has yet been devised for this purpose is a piece of rolled iron cut to proper dimensions and bent into something like the form of an eaves trough with a U section. This fills the space so as to prevent effectually the feet from being caught, and leaves free flange-room. One corner of the end of the trough or "shoe" should be turned down after the manner of some of the standing shirt collars. This turned down corner makes that portion of the trough lower and wider than the other or main body, and fills the space at the bend of the guard-rail in an effective manner. The trough is held in place by spikes driven through the bottom of the U into the ties. In protecting the entrance to frogs, the rolled iron must be cut tapering, so that when it is bent it will be six inches or more in width at the wide end, and two and a half at the other, so as to fill the throat of the frog running toward the point. The iron should be at least No.16 gauge, and the appliance, when properly cut and fitted, affords the best foot-guard yet in use. It is the cheapest, most durable and easiest applied, and more effective than any wood or steel filling. In this connection it will be noticed that illustrations of wood blocking have been widely circulated, showing the filling bolted into the "butts" of frogs *where no wheel flanges ever run*, and where a simple blocking of wood may be spiked in that will fill the space up to the surface of the rails.

The foregoing are some of the most important matters now up for the consideration of officials, as questions both of economy and of humanity. The adoption of such appliances as will reduce the liability to accident to a minimum is, or should be, the prime motive actuating railway managers, and in this field inventors may spend their time and exert their inventive genius with profit.

AMERICAN VERSUS EUROPEAN RAILWAYS.

BY AN OLD TRAVELER.

(Written for the AMERICAN RAILROAD JOURNAL.)

LOOKING over the files of the AMERICAN RAILROAD JOURNAL, I recently stumbled across an editorial in the issue of March 17th of last year in which English and American railway travel was sharply contrasted, to the material advantage of the latter. The animus which prompted the writer, lay in a slighting allusion to the American railway system contained in the latest edition of Chambers's Encyclopædia.

It is the fashion of travelers of all nationalities to exert their patriotism in behalf of home institutions and at the expense of foreign; as an old traveler, I am not free from this universal trait, nor am I at a loss to account for it. The familiarity with home methods, the knowledge of the ways and means obtaining in home institutions are natural incentives to the belief of a superiority that may not exist. In nothing does the claim of superiority appear so often as in the discussion of the relative merits of American and foreign traveling systems, and in nothing does habit more influence judgment. To obtain a fair and unbiased opinion as to the superiority of the one to the other, the searcher for truth must apply to the increasing body of cosmopolites—the old stagers to whom London,

Paris, Berlin, St. Petersburg, Vienna, and New York are but parts of a common whole, and which convey no idea of nationality. To the world's traveler there are no nations. Every typical city is but a section of a boundless town, in the several parts of which the habits and customs of the residents are peculiar and *sui generis*.

While not pretending to have acquired the right to deem myself a member of this apathetic class of nationless individuals, it has been my good or evil fortune to spend much of my time in traveling in Europe and America, and while, as becomes a good American, my predilections are strongly in favor of all that pertains to Columbia, my sober judgment and experience has led me to disarm prejudice in instituting comparisons. In the matter of railway travel, I lay it down as a wholsome truth that America has much to learn and much to teach.

It is necessary at the outset to institute a *fair* comparison. Nothing is easier than for an American to place in juxtaposition a magnificently equipped and leading American line of railway, with a second class line on the continent, and the result of this comparison would be very flattering to his national prejudices. The same would be equally true were an Englishman to contrast a British trunk line with some of our miserable railways in the South. But neither of these comparisons would be just. The leading types must be contrasted in order to form an honest judgment. The railway system of Europe exists in its perfection in Great Britain. France, I think, may fairly rank second in the completeness of its railway travel, while my experience justifies me in calling the Italian railways the poorest in their equipment and conduct of any I have patronized in Europe to an extent permitting me to form an honest and sober opinion. Here in America the finest roads are found in the New England and Middle States; the Western roads rank second, while the Southern railways, from the force of circumstances and the poverty of the surrounding territory, are the poorest in the country. I shall typify the American and European railways by taking on the one hand the leading lines of the Eastern and Atlantic States, and on the other, the main British lines. Each is taken at its ripest and most progressive stage, and a fair comparison may be drawn,

It is well to learn before we teach, and I will therefore endeavor to state those features of English railways that we could adopt in this country with advantage. Incidentally there are details of these features that are inferior to their American correlatives, and there is no sharp line of demarcation separating the two systems, enabling us to say that one entire feature of the one system is superior to the corresponding feature of the other. To a great extent we can only deal in generalities, and even then will be confronted with frequent points of exception.

The English railway—I mean the road itself—is, I think, far superior to the American. The road-bed is better ballasted and receives greater attention than in this country. Single-track roads are almost unknown, and the tracks cross a thoroughfare either above or below it. The chances of accidents are thus much lessened, and there is furthermore so excellent an apportionment in the duties of railway employés, that responsibilities are fixed. The English switch and signal system is a marvelous improvement upon the American. There, all lines are divided into sections, and all the switches upon each section are controlled at one point and are under the supervision of one official. The interlocking switch and signal system as employed upon English railways entirely precludes the possibility of a misplaced signal. It is impossible for trains to be derailed, and nothing but the most criminal negligence on the part of the engineer or driver, as he is called abroad, in failing to read aright the signals, can bring about a collision. Coroners' juries in England do not bring in verdicts exonerating all employés from blame in case of accidents. The class of men employed in responsible positions on English railways—drivers, stokers and guards—are perhaps not as intelligent as their American compeers, but as a class are more reliable and better trained. Track-construction in England is also superior to our own. Each rail is clamped, and a rail may be instantly taken up and another substituted without delaying travel. The clumsy and primitive spike is not used.

The stations along the line of English railways are superior in every way to those in America. Each is tastefully laid out with flower-beds and graveled walks, and you do not meet with the crazy sheds that are so common here. The English call them "stations" entirely, and are somewhat puzzled at the employment of the word "depot" in America. I don't wonder at that. We have no warrant for "depot," and I rejoice to see that the misuse of the word in this connection is disappearing. There is a uniformity about the stations on English railways that is pleasing. They may not have as palatial buildings as some in this country, but the average is certainly better, and there is never a disgraceful exception to their neatness and attractive appearance. I must say, however, that in providing interior accommodations for their patrons, the English railway stations fall behind the American. American travelers have found this out to their cost.

Upon the question of the comparitive speed of railway trains in England and America, much has been said, and on this point of all others, Americans have shown a disposition to yield the palm to their trans-Atlantic brethren. I doubt if the average speed of English trains is superior to that of American. In long distance trains I should say that America even had the advantge in the question of speed, for there are no English trains that maintain as high a speed as the Chicago limited, on the Pennsylvania, or other phenomenal express trains that have recently been put upon our main lines. But the English excel us in the speed of trains running short distances. They have no slow trains, and the speed attained by some of their trains for distances under one hundred miles has never been equaled on this side of the water. Local travel is not subordinated to through travel as in America, and in this respect the English public is treated with greater fairness. For this reason I should rank England ahead of America in the question of speed.

In punctuality and accommodation to the public, the English railways are far in advance of American. Trains are run exactly on time, as a general rule, and there are few vexatious delays experienced by the traveling public. It is perhaps easier to establish a system of punctuality in England than in America, for the territory in the former case is very limited, and there are no trains of over twelve hours' run. It also follows that the connections made between trains are not exposed to the delays which may arise from a multitude of causes when there are thousands of miles traversed without change of cars as in this country. Possibly, also, the better training of English

railway employés may also tend to render punctuality more common in England than in America. At any rate, that the English railways are ahead of ours in the punctuality of their trains, I have no hesitation in affirming.

The train accommodation of English railways is also much superior to that afforded the traveling public in America. The train schedules are drawn up with greater care, and the needs of the towns along the various lines more fairly considered. The English railways do not take advantage of towns in which they have a monopoly of travel, and while I am not familiar with the financial management of their roads, I should say that the English railway managers were less "on the make" than the American, in those cases where they possess a manifest advantage over their patrons.

I have epitomized those features of English railway travel and management which are superior to the corresponding features of American railways. In these respects America may learn some salutary lessons, and imitate the examples set by England with profit. It is not to be supposed, however, that the English railway is entirely superior to the American, for in some respects the latter is infinitely ahead. When the comparative comfort and luxury of rolling stock, to say nothing of comeliness, is called into question, the Americans can score a great advantage. The English railway carriage is immeasurably inferior to the American railroad car, both in comfort and in appearance, and the English engine is the homeliest of objects when compared with that beautiful specimen of workmanship, the American locomotive.

A few years ago, the system of first, second and third-class carriages prevalent in England would have rendered comparison very difficult with those of America, where but one class was employed. It is now, however, possible to divide the American railway cars into three grades, nearly corresponding with the three classes of the English. The Pullman, Wagner, and other parlor cars of American roads may be considered as corresponding with the first-class carriages of England; our ordinary passenger cars with the English second-class carriages, and our emigrant cars with the third-class. In the first two cases the comparison is strongly in favor of the American vehicles. The English first-class carriages are infinitely inferior to the Pullman and Wagner coaches, and are not even, to my way of thinking, up to our ordinary passenger cars—certainly not to those recently put upon the main lines extending westward from New York. The English carriage is a stuffy little box with doors upon the side, into which the passengers are locked like a herd of cattle. Having no aisles in the carriages, it is impossible for the train hands to pass through the train, no matter what the emergency. The tickets are collected while trains are standing at stations, and needlessly prolonged stoppages are thus made. There are no toilet conveniences on their carriages, and travelers frequently suffer the greatest physical discomforts. The ventilation is wretched, and no care is taken to render them conducive to comfort, nor, I must confess, are they subjected to as thorough and frequent cleanings as one might desire. The compartments are so divided that one-half of the passengers must ride backward, and of course the turning of seats is impossible. Mind you, I am speaking of the first-class carriages. The second-class are still worse, and the third-class are unspeakably vile. Sleeping cars were unknown in England until a few years ago, when some Pullman sleepers were put upon the Midland Railway, between London and Edinburgh. They are not viewed with much favor, however, and as the "Danbury *News* man" has aptly stated in his work on England, they are patronized almost exclusively by Americans—probably for the reason given by the same gentleman, that the English have a horror of being rushed into eternity in their night clothes. The English are nevertheless waking up in this matter, and several roads are making a specialty of cars on the American plan.

The system of handling baggage is also much superior in this country, and it is not until very recently that the English adopted any method of checking luggage from one station to another. On many English lines, baggage is not checked at all, and the passengers must take their chances. Trunks are shoved in a baggage or luggage compartment and "identified" by their owner. This may be a very easy way of baggage transportation, but it is open to the serious objection that somebody else might, and often does take a fancy to your paraphernalia and appropriate it unto himself before you know it.

There has also been a great deal said about the politeness of English railway officials, and certainly in that respect they are superior to American railway hands, but the reason is obvious—they expect to be feed, and their expectations are generally realized. In this connection I will say one thing in favor of English railways, and that is that all complaints of travelers are listened to with courtesy and attention, and rudeness and insolence on the part of employés is promptly punished.

Lastly, to consider the comparative rates of travel in England and America. This is a question that bears directly upon the purse, and is naturally not far from the heart—especially of our thrifty people. I can safely say that the rates are much lower in comparison in America than in England. Our rates for first class accommodations, parlor car included, are less than the rates for first class travel in England, and in most cases are no higher than those charged for second class. Our rates for traveling in ordinary passenger cars is about the same as the third class rates in England—possibly a little more, but very little, if any. As to our rates for emigrant travel, it is far below the lowest rates on English railways. These are cold facts, and call for no comment.

So much for passenger travel. In the matter of freight transportation, I should consider the American roads far in advance. The freight rates are much lower in this country, and the means of conveyance much superior. As a rule the English lines do not use box cars for their freight; it is generally put upon a platform car, and in case of bad weather, covered with tarpaulins.

I have endeavored to institute a fair comparison between European and American railway travel, exemplified on the one hand by the English railway system as a perfect type, and the conduct of the main American lines of the East and Northeast on the other. It is difficult to award the palm of superiority. Were I asked to say which roads I have found the more comfortable, I should say the American; which the safer, the European; which the cheaper, the American; which the more reliable, the European. The relative claims are pretty equally balanced, but on the whole I should deem the American railway system the more progressive. It must be borne in mind that America

is vast, compared with any country in Europe, (except Russia, where railways are in their infancy), and its population is increasing at a tremendous rate. It is therefore much more difficult to maintain a perfect system in this country. For that reason I am inclined to pronounce judgment in favor of the American railway, but am very far from thinking our own system immeasurably ahead of the European. Possibly even the slight advantage which I am disposed to award it, arises more from an unavoidable feeling of nationality than from a strict sense of justice, but in that I am not alone. The same may be said of any European who extols the foreign railway system; and in sober truth, there is so much to be said upon both sides that though an observer may signal special features in the two systems that are better or worse as the case may be, the average excellence is about the same, and in general, one is as good as the other. The two systems are approaching uniformity, and in both there are constant improvements.

THE ORNAMENTATION OF LOCOMOTIVES.

BY A MASTER CAR-PAINTER.

(Written for the AMERICAN RAILROAD JOURNAL.)

THERE is far more in the ornamentation of the locomotive than master mechanics or supers ever give heed to. They do not see that where a handsome piece of painting is put into the hands of an engineer, fireman or cleaner, there will be an extra exertion on their part to preserve it. They are blind, also, to the fact that a neatly painted and brassed engine and tender gives tone to their road, or in other words, lifts it out of the category of a one-horse line, entirely unfit for high grade passengers to patronize, where another line running to the same point can offer better appearing conveyances.

The rage some years ago for profuse ornamentation on tenders was seemingly going to extremes to find a medium. Large Roman scrolls, with a portrait or landscape, a monogram, or pictures of birds and beasts in the center-piece require the best talent in their execution, and that of course is expensive; and it is not to be wondered at that stockholders should demur at the lavish cost of painting. There is a limit to such things, and it should not be exceeded; while at the same time there is a point below which the rolling stock should not be allowed to go. A monster locomotive, coated all over with lampblack, with nothing to enliven its funereal appearance, no striping, scrolling, etc., does not appear to be in keeping with the gold bedecked palace coaches which are strung out behind it; and even upon the freight trains the caboose will, in most cases, outdo the engine in its ornamentation and luster.

One may notice with what care the fireman will jump off at a stop, and run over with waste, the bearings and the painted parts, keeping everything in order at all times. And again you may notice with what tenacity the men will cling to their hearse-like cab, never once leaving it except to squirt a little more oil upon working parts, or to give an extra "set up" to a key or nut. And while one machine goes steadily on until the continued wear and tear, and the effects of the atmosphere on the paint and varnish compels rejuvenation, the other rapidly decays for want of care, simply because there is nothing about the engine to be proud of.

The expense attached to a medium amount of striping and ornamenting is nothing compared to the difference in the care taken to preserve the work; and this is a subject which demands more than a passing thought. The oft repeated wiping with oily waste over the varnish, tends to preserve it, for the oil is absorbed by the continually decaying material, and a new life, as it were, is given it. The main dependence, or life of varnish, is oil, no matter whether it be linseed or machine oil; for the close combination of sulphur fumes from the furnace and the de-oxygenized air from the smoke stack is ever preying upon and destroying it, and while one machine is well wiped, the other is seldom gone over. This may be noticed more particularly upon an engine whose sand-box is nicely painted, and the tender plain black; the box will take the eye of the men engaged in wiping off, and receive a goodly share of rubbing, while the tender may possibly be scrubbed off with an old broom; the first always look well, the latter always seeming on the road to decay. Roman scrolling, such as was once put on for ornament, is considered the highest grade of such work, the bold stems and leaves rolling gracefully out as if they could be plucked from the ground on which they rested, the lights and shadows thrown in by a master hand, and the whole *tout ensemble* pleasing to the eye of every educated beholder. But such work is not necessary now upon a locomotive. The taste or fashion is changed, and a simpler arrangement of figures or arabesques—some even so crude that a schoolboy might equal, if not excel them on his slate, have taken the place of what we might term good work. The columns of this JOURNAL frequently teem with illustrations of the kind mentioned, and I will not add thereto.

Striping is an easy means of ornamentation, and an inexpensive one as well. If the painter has good taste in the arrangement of the lines, he may turn out some very nice work. Stenciling of flat scrolls for corners or around the number in the center of the panel may also be resorted to, and by turning to the back numbers of the JOURNAL, full directions will be found for making double stencil plates, by which the ties or bars of one stencil plate are covered by stenciling the second over it, thus taking off all appearance of a stenciled job. The gold size should be mixed quite thick with chrome yellow, so that it will stay where put, then carefully rubbed over the stencil plate, and be gilded before the second plate is used. If bronze is to take the place of leaf, various colored bronzes may be used, and this will require some little judgment on the part of the workman.

Bronze, if of a good quality, will make a durable job, to all appearance as good as gold; but in order to do this the bronze, which is composed of copper and zinc, or in some cases, the sulphuret of tin, must be coated with French shellac varnish to prevent the acid of ordinary copal varnish from bringing out the verdigris of the copper, and causing it to darken. Stencil patterns nicely cut in oiled pasteboard may be purchased from almost any large paint dealer.

To conclude, I wish to impress it upon the mind of those in charge of the work spoken of, that it is a great mistake to overlook the neat and tasteful painting of a machine which has cost a small mint to build, and it will be found far more economical in the end to finish a locomotive so that every one connected with it will feel suf

ficient pride in its appearance, to take especial care in wiping or cleaning it on every part, and in keeping it so.

EDUCATION OF LOCOMOTIVE ENGINEERS.

READ BEFORE THE RECENT CONVENTION OF THE AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION, BEING THE REPORT OF THE COMMITTEE ON THE "BEST MODE AND MANNER OF EDUCATING YOUNG MEN FOR LOCOMOTIVE ENGINEERS."

CONSIDERING this subject to be of vital importance to the Association and to the public in general, and that proper care and attention have not been given to it in the past, the committee have spared no pains to get all the information they possibly could on this subject, knowing and feeling that men selected to fill the responsible position of locomotive engineers must possess faculties that, as a general thing, do not belong to all the human race; and as locomotive engineers have to be selected from the ranks of firemen, they feel that due care and caution should be exercised in selecting young men for firemen. Now, to arrive at a proper conclusion—one that would be satisfactory to the Association and to the railways of the country, your committee sent circulars to all the Master Mechanics in the United States, Canada and Mexico. We sent out five hundred and thirty-two circulars, to which we received seventy-six replies, being on an average of one answer to every seven sent. Many of these replies contain very valuable information, and were from many of the leading roads of this country, Canada and Mexico. Your committee beg leave to return thanks for the answers to their circular.

The opinions given us by the different Master Mechanics who replied were as follows: Five recommended that none but machinists should be locomotive engineers; nineteen thought nothing more was needed than to have a young man fire from three to four years with good competent engineers to make him a good runner; fifty-two thought that one year in the shop and round-house, with two to three years' firing, was necessary to make a competent engineer; many recommended that young men, while firing, read and study books that would give them a general knowledge of the locomotive, such as "Forney's Catechism of the Locomotive," and several other works of that kind. Many of the replies admitted that machinists would make the best runners if they would consent to fire one year after having learned their trade, as they would then have the advantage of knowing all about the construction of the locomotive. Of course, when speaking of that class of men, they meant bright, intelligent young machinists—men with nerve and energy, and quick to act in cases of emergency. Of course, there are some who would never make engineers, no matter what opportunities were given them. If young men of this kind would consent to run one year or more as firemen, we could select our locomotive engineers from among that class; but they will not do it, from the belief that they are just as competent to run a locomotive as the best engineer on the road for which they are working, and if they are given an opportunity to run an engine they are certain to make a failure.

This being the fact, we are compelled to select our engineers from among the ranks of the firemen, as the best and safest runners. Now, this being the class of men from which we have to select our engineers, some uniform mode of instructing them for the responsible position that many of them will have to fill in the future will have to be adopted by the different railroads in America. Your committee would therefore recommend the following:

All Master Mechanics should have full control of the engineers and firemen in the employ of their respective roads, with full power to hire and discharge the same—of course, recognizing the rights that the General Managers or Superintendents have to order the discharge of any engineer or fireman for neglect of duty.

1st. The qualifications for the position of fireman on all the railways in America should be as follows: The applicant should be from eighteen to twenty-four years old, able-bodied and in good health, with a good common school education and a fair knowledge of arithmetic, and of sober and steady habits. All applicants should be required to make application in their own handwriting, signing it in the presence of the Master Mechanic or the person he may appoint to hire that class of men. In selecting men for firemen, great care should be exercised. The Master Mechanic should endeavor, so far as lies in his power, to select energetic, smart and active young men—men of nerve and presence of mind, quick to act in cases of emergency which may occur in the position they may be selected to fill in the future. If we select men of that kind, there will be very little difficulty in educating them up to the proper standard to fill the place of engineers.

2d. There should be three grades of firemen, classed as Junior, Intermediate and Senior Firemen—the young man just commencing to be classed as Junior Fireman, and so on up to Senior Fireman; the Senior Fireman receiving the highest pay for his services, the others in proportion. When a fireman has fired four years and is worthy of promotion and fully competent to run a locomotive, there may be no vacancies in the engineer force on the road by which he may be employed. In that case we recommend that he receive a small amount more per day than the Senior Fireman (say from fifteen to twenty cents per day more), and be ranked as Veteran Fireman. On the road which one of your committee represents in this Convention this custom has been in vogue for a number of years, and has worked exceedingly well. All the engineers on this road have been educated under this rule, and to-day no engineers in the country rank higher than they do.

Proper care should be taken in selecting young men for firemen as to their ability to distinguish colors in a practicable, common-sense way. We recommend that all railroads having a sufficient number of employés to justify them in so doing, have a reading room and library for their firemen and engineers, in which the other employés could participate. The library, to some extent, should consist of works on the locomotive engine that a man with fair education could understand. While we do not think it essentially necessary, still we believe it would be beneficial to some extent to let firemen work one year out of the four in the shop and round-house, so that they might obtain a more perfect knowledge of all the parts of the locomotive.

Young men consisting of the class we have mentioned are certain to make good runners, and there will be no difficulty, at the proper time, to select good junior engi-

neers from among that class of men. All opportunities possible should be given firemen to get such knowledge of the theory and movements of the different parts of the locomotive as would be beneficial to them when they enter on their career as engineers. To accomplish this end, monthly lectures might be given in the reading room by men of good practical common sense, who fully understand what they are talking about. If possible, these lectures should be given by one of the engineers. The firemen would learn more from him, as they would better understand what he was saying, he having formerly been one of them.

Your committee is convinced that if the mode recommended by them is adopted generally throughout the country that, if not all, a large majority of the firemen would be educated to a point from which there would be no difficulty in selecting men who will make good and reliable engineers.

3d. The fireman now being competent to run a locomotive, and being placed in charge of one, has yet some few things to learn that he did not have the opportunity of learning, from the fact that he was not running the engine. While he may run carefully and avoid accidents, he has to learn to run his engine with economy in the consumption of fuel and the cost of repairs. To learn this and to give the young engineer an opportunity to become a first-class man in his occupation, we recommend there be three grades of engineers—first, second and third grades—and that the remuneration they receive be according to grade; the fireman just promoted ranking in the third grade; after one year's service he enters the second grade; when two years have passed he enters the first grade, and becomes a first-class locomotive engineer.

Your committee is confident that if the different railways in the country will pursue the mode and manner laid down in this report, there will be no further difficulty in selecting good and faithful men to fill the responsible position of engineer.

The General National Exhibition at Budapest, 1885.

IN conformity with a bill submitted to the Hungarian legislature by Count Paul Szechényi, Royal Hungarian Minister of Agriculture, Commerce and Industry, the bill No. XII, of 1883, has been passed for the purpose of instituting a general national exhibition to be held at Budapest, the same having received the sanction of emperor Franz Joseph the First, King of Hungary. By this act the general national exhibition to be held in the year 1885, at Budapest, has not only been placed under the patronage of the Hungarian government, but has been declared a national question, the government being invested with the direction of the undertaking to propose and organize the same. A general commission has been appointed by the above-named minister ,and intrusted with the immediate management of the affairs of the exhibition. The general commission is composed of the following members: President, Dr. Alexander Matlekovits, secretary of state; second president, Count Eugen Zichy, president of the National Industrial Society; director, Dr. Julius Schnierer, counsellor of the ministry. It has beeen decided and decreed by the general commission, in consideration of the limited character of the exhibition, it being intended to produce as complete and faithful a picture as possible of the productions and handiworks of Hungary, to organize simultaneously with the general national exhibition, and on the same precincts, a separate international exhibition of motors and working machines, tools and implements for artisans and traders, as well as agricultural machines of the latest and most approved constructions, and all important patented inventions and improvements. It has accordingly been taken into consideration to propose the participation of foreign countries in this special exhibition, and to make arrangements for the exhibition of their superior productions. The special exhibition, as well as the general national exhibition, will be opened at Budapest on the first day of May, 1885, and closed on the fifteenth day of October, 1885.

Further particulars are to be found in Consular Reports for February, 1884, published by the Department of State, Washington.

The Economical Use of Turpentine.

TURPENTINE, though not an expensive material, is valuable, and should not be wasted. How often do we see a man attempting to pour from a five-gallon can, some turpentine to thin up a pot of paint, and instead of a pint going into the paint, a quart is spilled upon the floor. Turpentine is volatile, and a good portion evaporates, and if left standing in an open vessel or one not closely covered, much of it is wasted.

Again, we see it used as freely as water in rinsing out brushes, the "dirty turps" being thrown into the slush barrel; poured upon the hands when washing, slopped over the floor, and in other ways "made little of." The storage of turpentine can not be trusted to wooden barrels, for a slight shrinkage of the wood gives opportunity for leakage of the extremely limpid spirits, so as a general thing empty varnish cans are used to hold it. This is a good plan, but a better way to keep turpentine is to have one of the patent safety oil tanks such as are used by dealers in kerosene oil, having a reservoir and pump to raise the liquid, and a return drain by which all that is spilled in pumping returns to the reservoir again. This arrangement is becoming universal among large carriage builders, and it is said that a very perceptible difference is noticed in turpentine bills. No railroad paint-shop is complete without one of these tanks, and there are many kinds in market, and for sale in every large town, so that no excuse can be made for being without one.

To Keep Railroad Cars Cool.

THE French railroad authorities are at present engaged in a series of experiments from which, perhaps, our own directors might take some hints. With hot weather coming on, or at least in the ordinary course of nature expected, the problem is how to keep the railway carriages cool. In France travelers are packed very tight, and most trains go very slowly, and the authorities have to arrange to deliver their human cargoes at distant termini with vitality not quite extinct. So they are now exercised in seeking how to cool their carriages. They have gone as far as India for suggestions, and the favorite experiment is with a kind of punkah. A long cylinder runs

the length of the roof of the carriage, furnished with fans, set in motion by revolving the cylinder. After many systems tried, this seems to be the most practicable, and the only point in dispute is how to get the motive force. The surplus steam of the engine has been tried on one line, and on another a little arrangement like a windmill attached to each carriage, the motion of the train causing the wings to revolve, while the occupants of each carriage can regulate or arrest the stream of air. Both systems are being tested, and our companies need only take the benefit of these experiments and adopt the most successful or the least costly.

Railway Construction in 1883.

THE annual table issued by the *Railway Age* shows the following total railway construction in the States and Territories of the United States during the year 1883.

N. E. STATES.	ROADS.	MILES.
Maine	6	41.2
New Hampshire	.	....
Vermont	2	22.0
Massachusetts	4	18.0
Rhode Island	.	....
Connecticut	1	3.0
EASTERN MIDDLE.		
New York	10	399.2
New Jersey	2	7.5
Pennsylvania	26	363.5
Maryland, and District of Columbia	.	....
MIDDLE WESTERN.		
Ohio	15	349.0
Indiana	7	180.3
Michigan	16	421.3
Illinois	11	174.7
Wisconsin	10	218.8
PACIFIC BELT.		
California	6	251.0
Nevada	.	....
Oregon	5	196.3
Arizona	2	156.0
Idaho	2	282.0
Washington Territory	4	161.0
SOUTHERN STATES.		
Virginia	7	98.1
North Carolina	4	52.0
South Carolina	2	40.5
Georgia	6	65.5
Florida	7	245.2
Alabama	4	181.0
Mississippi	5	362.1
Tennessee	4	40.0
Kentucky	6	127.6
MISSOURI BELT.		
Minnesota	8	167.5
Iowa	8	231.4
Arkansas	8	198.5
Louisiana	6	238.1
KANSAS BELT.		
Dakota	11	410.8
Nebraska	9	199.2
Kansas	6	144.0
Indian Territory	2	12.2
Texas	7	68.5
COLORADO BELT.		
Colorado	9	88.8
Montana	4	413.0
New Mexico	3	81.0
Utah	2	160.0
Wyoming	.	....

RECAPITULATION:

	ROADS.	MILES.
New England States	13	84.2
Eastern Middle States	38	770.2
Western Middle States	59	1,344.1
Southern States	46	1,212.0
Pacific belt	19	1,046.3
Missouri belt	30	835.5
Kansas belt	35	834.5
Colorado belt	11	742.8
Totals	257	6,869.6

Except in 1880, 1881 and 1882, in which years 7,174, 9,784 and 11,591 miles of track were laid respectively, the total new railway mileage in 1883 is in excess of that of any year within the decade. The total railway mileage in the United States, Dec. 31 last, is given at 120,200 miles.

RAILWAY CONVENTIONS.

Master Car-Builders' Association.

FIRST DAY'S PROCEEDINGS.

THE Eighteenth Annual Convention of the Master Car-Builders' Association was called to order by its president, Leander Garey, Esq., of the N. Y. Cen. Railroad, at Congress Hall, Saratoga, on Tuesday, June 10, 1884, at 10.45 A. M. A formal address of welcome to the association was read by the Hon. P. H. Cowen, president of the village of Saratoga, for which the thanks of the association were returned by the president. The roll was called by the secretary, M. N. Forney, Esq. Minutes of last meeting were read and approved.

The opening address of the president, after presenting the list of subjects to be considered by the Convention, took up in detail the question of freight car-couplings, in which he quoted extracts from the Reports of the Railroad Commissioners of the States of Massachusetts and Minnesota, the subject of which was treated at length in an able article in the RAILROAD JOURNAL of last month.

Committees on Correspondence and Nominations were appointed by the Chair.

The report of the secretary briefly outlined the business of the association for the past year, giving as its membership, 133 active, 55 representative, and 4 associate members.

Invitations from the Saratoga, Mt. McGregor and Lake George, and the Boston, Hoosac Tunnel, and Western Railroads to excursions were read, and accepted by the association.

The printed report of the committee on Standard Freight and Passenger Trucks was then presented, and properly referred.

The report of the Executive Committee on Revision of Resolutions Relating to the Recommendation of Standards was next in order. Seven distinct changes were presented in the printed report, which were discussed and adopted with more or less amendments, after which the report was adopted as a whole, taking up matters of detail, for which we have not space, though manifestly of great interest and importance to the members of the association, and the roads they severally represent. At 1 o'clock, P. M., the Convention adjourned for dinner.

At 3.30 P. M., the Convention met to revise their rules governing the condition of and repairs to freight cars for the interchange of traffic, the discussion of which called out many suggestions looking towards the more practical working of these rules and to the settlement of many vexed questions incident to this branch of railway management. The meeting then adjourned until the following day.

SECOND DAY'S PROCEEDINGS.

At 10 o'clock, A. M., the meeting was called to order by the president, and an elaborate paper was read by the secretary, on the Relation of Railroad Wheels and Rails to each other. This paper was in print, and illustrated by numerous engravings. The paper was fully discussed by the members, and finally referred to a committee of five, Mr. Forney, chairman.

The Nominating Committee presented their report, as follows:

For President—Leander Garey, New York City, N. Y. Central and Hudson River Railroad.

Vice-Presidents—William McWood, of Cleveland, O., Grand Trunk Railway; John W. Cloud, of Altoona, Pa., Pennsylvania Railroad; B. K. Verbryck, of Chicago, Ill., Chicago, Rock Island and Pacific Railway.

Secretary—To be elected by the Ex. Com.

Treasurer—John Kirby, of Cleveland, O., Lake Shore and Michigan Southern Railway.

Three Members Ex. Com.—Joseph Townsend, of Bloomington, Ill., Chicago and Alton Railroad; F. D. Adams, of Allston, Mass., Boston and Albany Railroad; and Geo. W. Rhodes, of Aurora, Ill.

The report of Committee on Brake-Shoes, Brake-Beams, and the Interchangeable Parts of the Brake Arrangements, was then presented in print. Committee continued with instructions to report at the next meeting with drawings of a brake-shoe which they would recommend.

The Committee on Standards and Appliances for the safety of train-men, reported verbally through its chairman, Mr. John Kirby, that they had no detailed report to make. Committee continued, and requested to report at next meeting.

The report on Piece Work was read by its chairman, B. K. Verbryck, and accepted.

THIRD DAY'S PROCEEDINGS.

The meeting was called to order by the president, at ten o'clock, A. M. The reading of the minutes was dispensed with by unanimous consent. The report of the Auditing Committee was presented by W. R. Davenport, its chairman, and accepted.

Two committees upon subjects analogous in character, next came up for discussion, viz.: That on House Cars, and that on Framing and Trussing Freight Cars. The latter report was accepted, and the committee continued with instructions to report at the next meeting a form which they can recommend. The question of Freight Car Trucks was recalled for discussion. The general sense of the meeting was adverse to any radical change in the ordinary diamond truck. An informal expression of opinion in relation to the superiority of swinging bolsters over the rigid centers, showed a nearly equal division of the members. The matter was settled, leaving it optional with the builders to use either a rigid or swinging frame. The question of increasing the size of the standard master car-builders' axle in the center, from 3⅞ to 4¼ inches, was referred to a letter-ballot. The committee on Standard Trucks were also instructed to adopt the master car-builders' journal and journal-box.

The report of the committee on Automatic Freight Car Brakes was read by the secretary. Report accepted and committee discharged. In order to test the sense of the meeting, it was moved that none of the freight train brakes as yet brought to the notice of the Association, deriving their power from the compression of the draft-spring, fulfills the requirements of a good train brake. Carried.

A verbal report was made by T. A. Bissell, on Passenger Car Framing and Trussing. The report was accepted and the committee continued, with instructions to report at next meeting, a definite frame for the adoption of the Association.

A communication from the *Railway Gazette* as to a revision of the Dictionary of Railway Terms, was referred to the Executive Committee. Report on Car Roofs was read by its chairman, and the committee continued. Committee on next annual meeting presented its report, naming Baltimore, by D. C. Richardson, chairman, and finally, after some discussion and many votes, Fortress Monroe, Va., was chosen.

Upon reassembling in the afternoon, it was moved that the matter of Car Lettering be submitted to letter-ballot for settlement. Carried.

The committee on Side Dumping and Drop Bottom Coal Cars requested more time, which was granted.

The report of the committee on Automatic Freight Car Couplers was then submitted, and much discussion followed. A committee was finally appointed to make experiments with numerous couplings.

The customary vote of thanks was then extended to those who had aided to render the Convention a success.

The report of the committee on Nominations was then taken from the table for action. Mr. Rhodes having withdrawn his name as a member of the Executive Committee, that of Mr. E. B. Wall, of Columbus, O., was substituted, and upon motion, the Secretary cast the vote of the Association for those whose names had been submitted who were then declared elected.

President Garey returned thanks for his rëelection, and asked if there was any further business before the meeting.

The committee on Subjects for the next meeting asked permission to report to the Executive Committee at some future time, which was granted.

On motion, the meeting adjourned at 6.50 P. M.

American Railway Master Mechanics' Association.

FIRST DAY'S PROCEEDINGS.

THE Seventeenth Annual Convention of the American Railway Master Mechanics' Association was held at the Ocean Hotel, Long Branch, N. J., commencing on Tuesday, June 17, and continuing for three days.

The Convention was called to order by the president, Reuben Welles, of Louisville, Ky., and was opened with a prayer by the Rev. T. F. Brown, of Long Branch, followed by an address of welcome by the Rev. E. Tompkins, of the same place. Forty-nine members answered the roll call at the opening of the session, and some thirty more arrived before the close of the day. An unusually large attendance was present during the progress of the Convention.

The reports of the seeretary and treasurer were then read and accepted.

The secretary stated that many copies of the annual reports of the Association had been purchased by railway companies and managers, showing the wide-spread interest which prevailed regarding the deliberations of the Association.

The reports of the various committees were then handed in for discussion when the convention should determine to proceed to their consideration.

The committee on Entertainment reported that an excursion to Coney Island would be held on the following day, and that the banquet of the Association would be held on the evening of the 18th, at the hotel. Mr. Charles Parry, of the Baldwin Locomotive Works, of Philadelphia, tendered the Association an invitation to

visit Beach Haven on Thursday, the 19th, and remain over night as his guests at the Hotel Baldwin, at that place. The Philadelphia and Reading Railroad, through its general manager, Mr. I. E. Wootten, supplemented this invitation by offering to place a special train to Beach Haven at the disposal of the Association, on Thursday afternoon. The invitations were accepted with thanks.

The next order of business was the consideration of the committee on the subject of Improvement in Boiler Construction. The report was exhaustive, there being many points on which the members of the committee disagreed. The report was discussed at length, and occupied the balance of the first day's session.

SECOND DAY'S PROCEEDINGS.

The second day's session was called to order on Wednesday morning, the president in the chair.

The report of the committee on New Plans of Construction and Improvements in Locomotives, presented their report, which was received.

The committee on Smoke Stacks and Spark Arresters reported that they had had no time to properly investigate so important a subject, and asked that experts be employed to handle the problem.

The committee on Shop Tools and Machinery, submitted a report, which was received.

The report of the committee on the Best Material for Locomotive Truck and Tender Wheels, provoked an interesting discussion on the relative merits of steel tires and chill wheels, which consumed the remainder of Wednesday's session.

In the afternoon the Association and its guests took an excursion in accordance with the programme, and sailed to Coney Island and through New York harbor on one of the boats of the Iron Steamboat Company.

In the evening the annual banquet of the Association was held in the dining room of the Ocean Hotel.

THIRD DAY'S PROCEEDINGS.

The president called the Association to order, and stated that the first business for consideration was the reading of the report of the committee on the Best Practical Method of Educating Engineers. This report, which had been previously printed, was then read and adopted.

The report of the committee on Balanced Slide Valves was then read and received. A discussion followed on the merits of the Allen-Richardson and Morse Valves.

The committee on the Best Method and Material for Lubricating Valves and Cylinders, submitted a report which was received with but little discussion.

The president announced that the reading of papers by associate members was next in order. The secretary then read a paper by Angus Sinclair, of the *American Machinist*, on Fuel Economy with Locomotives, and Mr. F. W. Dean, of Harvard College, an article on the Strain on the Coupling Rods of Passenger Locomotives.

Having completed the regular order of business, the president stated that the Convention was prepared to entertain any motion that might be put before the meeting, and several resolutions regarding the standards adopted by the Association were offered and passed.

The Auditing Committee reported that they had examined the accounts of the Treasurer of the Association, and found them correct, which report was accepted.

The committee on the Selection of Subjects for the next convention, submitted the following report, which was adopted:

1. Improvement in Boiler Construction.
2. New Plans for Construction and Improvements in Locomotives.
3. Improvements in Valve Gear.
4. Steel Castings for Locomotives.
5. Best Metal for Locomotive Bearings.
6. Driving Wheel Brakes: To what Extent is their Use Advisable.
7. Is the Frequent Testing of Boilers by Hydraulic Pressure Advisable?
8. Smoke Stacks and Spark Arresters.
9. Shop Tools and Machinery.

The committee on Resolutions offered a vote of thanks to all those who had contributed to the entertainment of the Association, which was adopted.

The Nominating Committee submitted the following names:

For President—J. H. Flynn, of Atlanta, Ga.; For 1st Vice-President—J. Davis Barnett, of Port Hope, Ont., Canada; For 2d Vice-President—W. Woodcock, of Elizabethport, N. J.; For Treasurer—Geo. Richards, of Boston, Mass.; For Secretary—J. H. Setchel, of Cincinnati, O.; For Mem. Com. on Subjects—T. B. Twombly, of Chicago, Ill.

The report was accepted, and the foregoing gentlemen were elected to their respective offices by ballot.

A vote of thanks was extended to the retiring president for the able manner in which he had conducted the deliberations of the Association, to which he briefly responded, while the newly-elected officers expressed their thanks for the honors conferred upon them.

On motion, the salary of the secretary for the past year was fixed at $800.

The committee on the Place of Meeting for the next Convention, reported in favor of Cincinnati, Niagara Falls, or Montreal.

Several members suggested that, as the Conventions of the Association had for a number of years been held in Northern cities, it would be well to select as the next place of meeting, some point further south; and on motion, Washington was added to the report.

A ballot being taken, Washington received a majority of all the votes cast, and the president declared it to be the next place of meeting of the Association.

On a motion to that effect, the president declared the meeting adjourned to meet on the third Tuesday of June, 1885, in Washington, D. C.

At three o'clock a special train took the members with their families and guests to Beach Haven, where they were entertained at the Hotel Baldwin. The special train returned the following day and landed its passengers in New York city.

CHAUNCEY DEPEW says the sooner a poor doctor, lawyer, or clergyman recognizes that his genius is for merchandise or types, or the skilled trades or accounts, the better for himself, his profession and the world. He has secured positions for two lawyers—one as a brakeman, the other as a freight clerk—and both are advancing with rapid strides and confident aspirations toward the presidency of the road.

American Railroad Journal.

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ADVERTISERS and subscribers are respectfully cautioned against making payments to any person professing to represent this JOURNAL *excepting he is able to show a written order from this office.*

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NEW YORK, JUNE, 1884.

Principal Contents of this Number.

A NEW POLICY.

THE present issue of the AMERICAN RAILROAD JOURNAL appears under a new editor and business manager, the publication office has been removed to 323 Pearl street, the building occupied by our printers, and to quarters in every way superior to the old.

The *personnel* and location of the JOURNAL having been changed, it will also appear to our readers that the general interior form of the publication has also been modified, and a new policy inaugurated. It is our purpose to furnish the railroad world with a style of journalism differing greatly from the numerous publications devoted to its interests. We propose to make the JOURNAL not a newspaper but a monthly railway magazine and review. The daily press furnish more fully than any railroad publication the current railroad news, financial statements and stock quotations. With this branch of intelligence we shall deal as briefly as possible, and devote our energies to the discussion of questions of railway construction and management, and the solution of problems that present themselves to the consideration of railway managers, engineers, mechanics, and others whose interests are concerned therein.

In order more fully to accomplish our designs we have made arrangements for the publication of a series of contributed articles on appropriate subjects from experts and prominent railroad men, the first installment of which appears in the current number. The first pages of the JOURNAL will be devoted to these contributions, of which we hope to have several each month. After these will come such interesting original and selected items as may be written or chosen for their value to our readers. Following pages will be appropriated to the editorial and correspondence departments, and upon the former much attention will be bestowed. The current railway questions of the day will be freely and fairly discussed, and all subjects considered that bear either directly or remotely upon railway interests. Our department of correspondence will be open for the expression of individual opinion upon any subject of contingent interest, and all information desired upon technical and mechanical questions will be cheerfully furnished. The AMERICAN RAILROAD JOURNAL was the first railway publication to recognize the interests of tramways, and our tramway department will receive vigorous attention. Contributions on subjects pertinent to tramway construction and conduct will frequently be published, and especial care given to the absorbing subject of tramway traction. The concluding pages of the JOURNAL will, as heretofore, be devoted to the discussion and explanation of new inventions tending to improve and simplify the present systems employed in the minutiæ of railway management, and the selection will be made solely with regard to their interest and value.

With the announcement of these changes and improvements we ask for the continued and increased support of the railroad world. Not only do we immediately inaugurate our new policy, but we shall endeavor to act up to the belief that no human production can be so good that there is not a superior plane of excellence attainable, and having once begun to climb, we shall endeavor to continue. All we ask is that those who deem such a publication as we propose to furnish desirable, shall give us a fair hearing and decide for or against us on the merits of the case.

A WALL STREET HOMILY.

THE smoke has cleared away from Wall street, and the financial battle which fiercely raged on the memorable 14th day of May is a thing of the past. The corpses have been buried and the wounded given the necessary recuperative attention, and Wall street is the same as ever. A little soberer perhaps, less confiding, less generous, but neither wiser nor more scrupulous.

The oracles and quidnuncs have had full sway, and there has been a powerful exhibition of that peculiar form of sagacity known as hindsight. Probably of the thousand who knew the crash was coming months ago, not ten foretold it at the time, and of course the nine hundred and ninety are greatly to be commended for their reticence and prudence in locking their startling information within their breasts. The numerous theories advanced to account for the upheaval are varied and highly colored, and there is a pleasing diversity about them which enables biased persons to select those exactly in accordance with their inclinations. The bears may lay it to the bulls, and the bulls to the bears; the brokers to the banks, and the banks to the brokers; finance to commerce, and commerce to finance. Even politics is lugged in by the ears, and there are thousands of ardent Republicans who will claim the panic to be an outgrowth of democratic tariff tinkering, and thousands of equally ardent Democrats who will assign as the cause of the panic the maladministration and corruption of the Republican party. It is a case where "you pays your money and takes your choice."

But this time trade and commerce view the convulsion with indifference, and the laugh is upon their side. Unlike the panic of 1873, the present situation is confined to the actors in the scene. Of the forty or more prominent houses that have succumbed within the past few weeks, scarcely one is a strictly commercial concern. The money of the people is no longer in Wall street, nor after recent developments would it seem likely to be for many years to come. The whole panic was a huge game of bluff, in which rascality and audacity finally came to grief.

Brushing aside the visionary and exculpatory theories tending to solve the cause of the panic, the outside world, trade, commerce and the press, seems unanimous upon one point. The panic was a stock gambler's panic. The fictitious values assigned to worthless stocks, the blind confidence imposed in unscrupulous brokers by unsophisticated speculators, and the daring recklessness of parvenu operators, had raised Wall street to fever heat. All that was needed to bring about a catastrophe was a single exposure of fraud and rascality, and it came in the failure of GRANT & WARD. Like a herd of panic-stricken cattle, the speculators crowded each other off the brink of the precipice, in a frantic effort for personal safety.

Last year Wall street was in good humor and ready for any kind of frivolous sport. Upon the appearance of the new five-cent piece a number of mirthful brokers seized the occasion for a burlesque of speculation. The new five-cent pieces were bought and sold and treated as negotiable securities. "Puts" and "calls" were offered, and the street made merry at the expense of the much abused coin. It is stated that one broker who had sold "short," was compelled to suspend with liabilities of $2.75. It was a foolish, harmless jest, scarce worth repetition, did it not serve to illustrate the methods and practices which precipitated the panic, and render a similar occurrence a menacing possibility of the future. There are stocks negotiated to-day which are absolutely worthless. Stocks upon which dividends have never been and never will be paid, yet which are quoted at prices in excess of those of fairly paying securities. They answer the purpose of gambling chips, and that is the beginning and end of their usefulness. There are corporate charters in existence which, for lack of a better adjective, we might denominate "still" charters. The organizations to which they are supposed to give corporate life are purely mythical, nor is their existence even a contemplation of the remote future. The charters were obtained simply for the purpose of issuing stock, as a medium of Wall street gambling. What wonder there are panics when there are hundreds who derive their living from the barter of such trash as the worthless stock of bogus corporations?

The brokers—the legitimate "regular" brokers—despise the bucket-shop and the bucket-shop methods, but are they one whit better because they gamble for thousands while their humble imitators hazard their units? We fail to see it, and even think the burden of guilt is commensurate with the sums involved. It is common sense to presume that a crash of millions is more hurtful than a flurry of hundreds, and the bucket-shops are guiltless at any rate of hypocrisy. They don't pretend to anything better than gambling, and do not cover their practices with any claims to ultra-respectability.

Go on gentlemen! It may amuse you to make fortunes and lose them in the twinkling of an eye. There may be something entertaining in seeing your fellow gamblers ruined, and ere you have recovered your gravity meeting

with ruin at your own door. There is doubtless much high-tone in striving for wealth in a race where dissimulation, selfishness and rascality has the best show, and a high degree of finesse is unquestionably required to ruin your friends and give them your commiseration and sympathy at the same time. This is a great country, and ideas of morality have been somewhat modified since the days of the pilgrim fathers—they were old fogies, and modern progress only laughs at their stiff-backed honesty. No doubt you are right, and yours are the correct principles of business and individual honor. But with all deference we will let you play your own game. If we should take a hand the sport might be spoiled by the introduction of some bungling old-fashioned honesty that would complicate and upset your calculations. No, thank you. We will watch the game this time from a disinterested standpoint. We got one experience eleven years ago, and it wasn't the first, either, but it will be the last. We don't understand your methods nor you ours, so we had better not travel the same road. Good luck to you, and the devil take the hindmost.

If we are not mistaken the voice of the people is very much to the above effect. They don't want that kind of fun. If they want to gamble they can do so without seeking the purlieus of Wall street, and there are greater chances in their favor around a faro table or in a game of draw poker. As to the uses of Wall street, they are chiefly imaginative quantities. To say that the strength of the nation is in Wall street is equivalent to saying that the talent and genius of the country is possessed by the SULLIVANS and FITZGERALDS, and other heroes of the ring and track. It is said that the bulls and bears contemplate a change of locality. We would suggest as appropriate headquarters either the North pole, or an island in the middle of the Pacific ocean—the farther off the better. And gentlemen, pray don't hesitate because you think the country would suffer. In that you are mistaken. It won't suffer a bit.

WANTED ELSEWHERE.

THE railroad world has been favored with two representative conventions during the past month; those of the Master Car-Builders and the Railway Master Mechanics. It would be difficult to find any public gatherings of men that could so well illustrate the development of American intelligence as the two conventions in question. The solid worth and character of the members of the two associations speak volumes for the innate resources of strength in the American mechanic, of which they are the perfect type; and after attending their meetings we fain give a sigh of regret that this element of national strength is not present in other deliberative bodies. Would that our State and National Legislatures could recruit its members from such ranks as these, and in place of the pot-house politician and shallow demagogue, call to their council halls these veterans of skilled labor who by sheer force of character and intelligence have risen from the ranks to positions commanding the respect and deference of capital. And it is not with such men that capital is arrayed against labor. Loyal to those whom they have outstripped in the race where worth is the victor, they are quick to recognize the truth that the interests of capital and labor are identical; that labor is the employer of capital as truly as capital is the employer of labor. Guided by the deliberations and advice of such men, the American workingman would be a factor in the nation beyond his fondest hopes.

RAILWAY SPEED.

PROBABLY no man achieved greater success in the face of well-nigh insurmountable obstacles than did the "father of railways," GEORGE STEPHENSON. Opposed by the powerful toll-road companies of England who possessed a monopoly of travel, by the people themselves, who through ignorance dreaded the imaginary dangers attendant upon the introduction of railways, and even by the British Parliament which solemnly chartered the first railway with the proviso that it should carry no passengers, STEPHENSON persevered and lived to see the mail-coach rotting in the stable-yards, while the iron bands of a score of lines spread out in all directions. But he was not flushed with success, nor is it likely that any man will ever see further ahead and view the possibilities of the future with a clearer mind or calmer deliberation than he. When the little "Rocket," the first locomotive regularly run upon a railway, accomplished a speed of thirty-five miles an hour, there were thousands, who but a few months before had deemed railway travel the dream of an enthusiast, quick to prophesy an ultimate speed of one hundred, and even one hundred and fifty miles per hour. Not so with STEPHENSON. He studied the subject and claimed that the maximum speed which could ever be obtained upon any level stretch of railway would very little exceed sixty miles per hour, and his prophecy has so far been fulfilled. Sixty miles per hour is to-day regarded as extraordinary speed, and the few trains that exceed this figure are almost historical. As STEPHENSON was right in his premises, there is reason to presume that he will be proved correct in his conclusions, but great as were his talents, there is much that was unknown to him, and in fact to the world in his time. It is evident that his calculations of the maximum attainable speed was based upon the supposition that steam would be the motive power in the future as well as in his own time, and the crude knowledge then extant of the enormous hidden powers of electricity prevented his considering that mo-

tive power as applied to railway locomotion. That there is a limit to the achievements of steam as a motive power, is to us most evident. That the maximum speed of railway trains has almost been reached with steam the power employed, seems probable, in view of the fact that while every other branch of mechanical learning has developed new and valuable inventions and modifications, steam power has been practically at a stand-still. In that respect we are no better off than we were twenty years ago. While there has been an improvement in steam methods, steam can do no more now than it could then. Electricity has in the past ten years given us the electric light, the telephone, the duplex system of telegraphy, electric storage, and a dozen other inventions. But in that time steam has practically made no advancement. Even in its own field as a motive power it has been met with rivalry from heat, gas and electricity.

For that reason we are inclined to believe that GEORGE STEPHENSON was a true prophet when he placed the maximum of railway speed with steam as a motive power at a little over sixty miles per hour. It is to electricity that we must look for the great achievements in the increase of railway speed, and there is consolation in reflecting that the era of steam is approaching its conclusion, while that of electricity has but just dawned. If in its infancy electricity can so astound the world with its marvelous achievements, it has a future beyond the wildest dreams of the most enthusiastic electrician. The present generation will lose much by dying so early, but even in the few remaining years left us we must prepare to be astounded by the results of research in the fields of electricity.

EDITORIAL NOTES.

THE numerous army of car-coupling inventors will be cheered at the news from Massachusetts. The Legislature of that State has enacted that all railways under its jurisdiction shall, after the first day of March, 1885, employ automatic safety couplers upon their cars, and the enforcement of this law is placed in the hands of the Railroad Commissioners. The board is to meet in Boston on the 25th of September next, to examine and test the various appliances that may be submitted, and notice has been served upon the inventors of car-coupling appliances to submit models of their inventions on that date. The context of the law and the official notice of the Railroad Commissioners appear upon another page, and we presume all desired information can be obtained from the Commissioners themselves. In the meantime we shall watch the development of the law with much interest, for if successful in Massachusetts, it will undoubtedly be adopted in other states.

ALL fears of a submarine invasion of England have been dissipated at least for the present, since the channel tunnel project was rejected by an overwhelming vote in the House of Commons. It scarcely seems possible that the idea was abandoned through the absurd proposition that France might utilize the tunnel for invasion by her troops in event of war, yet it is amazing to note the serious attention which this suggestion received. Whatever the cause of abandonment, it is extremely doubtful if the project will ever be revived.

* * *

THE active rivalry between the great trunk lines has resulted in greatly increased comfort to the traveling public. Notably is this the case in the superior rolling stock and means of restauration. The new passenger cars of many lines are marvels of luxury and good taste, and in some instances the running of Pullmans upon the trains seems a work of supererogation. Some of the Western express trains are microcosms, and there is scarcely a need that the traveler cannot have supplied without leaving the cars. The painting and decoration of cars has greatly improved by being diminished, and the roads have been quick to grasp the æsthetic principle that natural woods are more decorative than the most elaborate fresco, to say nothing of their durability.

* * *

SPEAKING of new principles of decoration causes us to reflect how quickly an example is followed. The Pennsylvania Railroad was the first to paint its ferry boats the same color as its cars, and the other lines are rapidly following in its wake. The harbor will soon present the appearance of a kaleidoscope, and the boats of the various lines will be recognized as soon as sighted. The New Jersey Central, or its successor, the Philadelphia and Reading, is to be commended for one admirable change in style. There are now upon the boats of this line no "ladies'" or "gents'" cabins. The cabins bear the simple inscriptions, "men" and "women." We believe the waiting-rooms and entrances of the Brooklyn Bridge were the first places in which was adopted the simplest form of sex distinction, and we rejoice that the seed then sown has born such early fruit. The indiscriminate use of the word "lady" is most offensive to all good taste and propriety, and has ceased to convey the slightest signification otherwise than a designation of sex. It might be thrown out of the language altogether with benefit, and in its proper place be substituted the old-fashioned but simple and suggestive appellation of "gentlewoman." The French, who lead us in such matters, have entirely dropped the French equivalent of "lady," and we are glad to hear it. The word "gentleman" as applied nowadays to every individual of the masculine gender is equally distasteful, but—heaven spare us!—what is to be said of "gent," the

vilest and most corrupt and demoralizing abbreviation that has ever crept into our mother tongue, with possibly one exception. The word and the exception are superbly aphorized by the New York *Sun* when it said that "'gents' wore 'pants.'" It is high time people learnt that sex is no cause for shame, and if there are better words to express the sex of individuals than man and woman, we have yet to know them.

* * *

THE West Shore Road has finally passed into the hands of a receiver, and the financial standing of the Philadelphia and Reading is not as favorable as might be desired. For some reason or other railways tumble into insolvency without materially damaging their prosperity. A broker remarked in our hearing, a few days since, that there were some things about his business that he didn't understand. "It is a mystery to me," he said, "how a road can be declared bankrupt, and this declaration be immediately followed by a rise in its stock." There are, truly, a few surprising contradictions in this world, and the above is not the least remarkable.

* * *

THE political caldron has commenced to boil, and in the course of a month or two it will be at seething point; and we feel it our duty, at this juncture, to breathe a few words of warning to the Democratic party whose national convention is to be held next month. At present the indications point to the nomination, by that body, of our worthy Governor, GROVER CLEVELAND, and right here the Democratic party may rush blindly into a fatal error. The Constitution of our country expressly provides that the president shall be a native of the United States, and the great bulk of Democracy do not seem to be aware of the fact that Governor CLEVELAND is credibly stated to be a native of New Jersey.

* * *

THE transfer of the AMERICAN RAILROAD JOURNAL to its present management has entailed a delay in the publication of the present number, for which we trust the superior nature of its contents will make ample amends. The continuation of the Retrospect of Railways in America has been omitted from our columns this month on account of the pressure made upon them by other matter.

* * *

AMONG the many persons who write to the editor or business manager of the JOURNAL, there are a few who omit what they should give, as well for their own convenience as for ours—namely, their full address. To do this would save a good deal of needless trouble for all concerned.

Chicago, Parkersburgh and Norfolk Railway Company.

THE BLACK DIAMOND SYSTEM IN WEST VIRGINIA.

[SPECIAL CORRESPONDENCE OF THE AMERICAN RAILROAD JOURNAL.]

PARKERSBURGH, W. VA., May 31st, 1884.

THE organization of the Chicago, Parkersburgh and Norfolk Railway Company took place at Hall's Hotel. The meeting was called to order promptly at 9 o'clock by Dr. Scott, and upon motion he was nominated temporary chairman, R. M. Hughes, temporary secretary. A recess was then taken until two (2) P. M.; at that hour the meeting was again called, and after the stock matter and by-laws had been attended to, the election of the directors followed. The following directors were elected: Albert E. Boone, W. W. Lucas, W. M. Morse, F. O. Walker, Dr. Isaac Scott, Hon. Geo. Loomis, A. N. Williams, Sidney F. Shaw, C. B. Smith, Gordon B. Gibbons, A. B. Beckwith, City; and D. B. Casto, of Elizabeth, Wirt Co. No other business, the stockholders adjourned, and the directors met immediately thereafter, with Sidney F. Shaw, as chairman. The directors then elected the following officers: President and general manager, Albert E. Boone; vice-president, Dr. Isaac Scott; auditor, A. N. Williams; treasurer, Hon. Geo. Loomis; attorney, W. L. Cole; chief engineer, Col. Jno. B. Yates. Capt. Sidney F. Shaw was then appointed chief of right of way, and the meeting then adjourned, subject to the call of the president.

The survey commenced on June 2d, and the line is ready to be let for contract as soon as possible.

RAILROADER.

High Speed Locomotives.

DISCUSSING the practicability of constructing a locomotive that will be capable of maintaining a speed of sixty miles an hour, the London *Engineer* says: "There are three different ways in which sufficient boiler power—say 1,500 horses—can be obtained on a narrow-gauge—4′ 8½″—road. The first consists in so constructing the engine that the fire-box shall be nearly the full width of the machine. The second consists in altering the construction of the grade. The third in adopting mineral oil as a fuel, either in conjunction with coal or by itself. We put the wide fire-box scheme first, because experience acquired in the United States seems to indicate that the plan is perfectly feasible. Mr. Wootten has run his engines successfully at seventy-five miles an hour. Their driving wheels are only five feet eight inches in diameter, and their grates are nine feet long by eight feet wide. The fire-box spreads far over trailing wheels on each side, and the center of gravity of the machine is very high, but this elevation of the center of gravity promotes steadiness and gets rid of the bumping, jerking motion of engines with low boilers and wheels. The true difficulty about the Wootten engine appears to be the excessive speed at which the reciprocating parts must move. A five-foot eight-inch wheel, running at seventy-five miles an hour, makes nearly 366 revolutions per minute. With a piston stroke of two feet this means 1,464 feet of piston speed per minute. There is no objection to this high velocity; but there is a great deal to the fact that the piston, with all its appendages, as the cross-head, connecting-rod,

etc., should have to be stopped and started 732 times in a minute. Even higher velocities of rotation are obtained by screw engines in torpedo boats, but difficulties are got over with them by making all the moving parts very light. Unfortunately the same thing cannot be done with locomotives. Mr. Wootten, however, manages to get his engines over the road at seventy-five miles an hour without accidents, and if he does this there is no reason why we should not be able to do the same with small wheels."

Fast Time on the Baltimore and Ohio.

A DISPATCH from Washington, June 8, says: "The special newspaper train over the Baltimore and Ohio road, conveying the Washington correspondents from the convention, left Chicago at 2.10 P. M. Saturday (or 3.10 Eastern time) and arrived here at 2 o'clock this afternoon, making the run of 813 miles in twenty-three hours, while the actual running time was but nineteen hours and thirty minutes. The time of the special from Chicago to Chicago Junction—273 miles—was six hours and thirty minutes; actual running time five hours and thirty-five minutes, an average rate of upward of fifty-two miles an hour, an unprecedented run for the distance. At one time fifty-seven miles were accomplished in fifty-nine minutes, and frequently single miles in from fifty-six to fifty-eight seconds. The final twenty-seven miles from Barnesville to the Ohio River was made in twenty-eight minutes, and six miles of the distance was run in four minutes, or at the rate of ninety miles an hour. The 463 miles from Chicago to the Ohio was run in eleven hours and twenty minutes, including thirty-eight stops. Actual running time, nine hours and twenty minutes, or the unparalleled average for the distance of fully fifty miles per hour. From the river to Washington the run was an excellent one, but no special effort was made other than to bring the entire run within twenty-three hours until Washington Junction was reached, when the engineer was instructed to run in the last forty-four miles at the rate of a mile a minute. He exceeded the limit by half a minute, and ran the last sixteen and three-quarter miles in fourteen minutes, the forty-four miles in forty-three minutes and thirty seconds. Notwithstanding the high rate of speed attained, the convention-weary correspondents enjoyed a most comfortable night's rest, and there is no doubt that the actual running time could have been reduced to eighteen hours between Chicago and Washington. The correspondents adopted a series of resolutions thanking Major Pangborn for the luxurious train, and Charles Selden, of the telegraph company, and Conductor Duvall, for courtesies."

Railroads in Venezuela.

THE first railroad built and operated in Venezuela began at Puerto Cabello and led to the westward. About ten miles were built and operated, but embarrassment followed, and nothing is now to be seen except a dim outline of the roadbed. About the year 1870 an English company built a two-foot gauge road from Tucacas to the mines of Aroa, a distance of fifty-five and one-half miles. Poisonous reptiles, wild animals, malaria and dense jungles combined to obstruct the building of the road. The largest bridge has a span of ninety feet. The ties, bridges, and even the telegraph poles are of iron. The road for its last five miles has a grade of 600 feet, requiring specially constructed engines. The freight carry from five to six tons, and the passenger cars about thirty passengers. A road from La Guyra to Caracas, a distance of twenty-two miles, has been in process of construction for several years. The track of the road is three and one-half foot gauge. It is built on a series of reverse curves having a radius of 140 feet. Surveys have been made for other lines, and a small amount of grading has been done on a road forty miles long from Puerto Cabello to Valencia.

An Excellent Plan.

THE Superintendents of some of the leading railroads in Canada having agreed to coöperate with the Meteorological Department at Toronto, a system of weather train-signals has been arranged which, if found to work advantageously, may hereafter be extended. The signals consist of disks arranged to display a sun, moon, or star. The sun is to indicate fine weather, the moon to indicate local showers, and the star wet. They will be carried on the morning trains leaving railroad centers, so that all those who see the morning express-trains will have the forecast. This service is intended for the benefit of the farming community.

THE Greencastle and Southern Railroad Company, with a capital stock of $5,000,000, has been incorporated. Its charter gives it the right to construct railway lines in Putnam, Clay, Owen, Greene, Sullivan, Knox, Daviess, Martin, Dubois, Warwick, Spencer and Perry counties, Indiana, including a line from Greencastle to Vincennes and also to the Ohio River, a total estimated length of 200 miles. Wm. H. Durham, Volney Irwin, Wm. Ermentrout, Gilbert H. Brown, Wm. Daggy, Henry Jordan and John H. Piercy are the directors for the first year, with Durham as president, Ermentrout, vice-president, and Brown, secretary and treasurer.

THE dispute between the Pennsylvania and Philadelphia and Reading Roads with regard to their joint lease of the New York and Long Branch Railroad has finally been settled without the intervention of the courts. The two companies are to run trains over the Long Branch road independently of each other, and are each to guarantee the leased road a yearly payment of $206,000.

SUBSCRIPTIONS for more than seventeen times the desired sum are offered in response to a call of the Russian Government for a loan of £15,000,000 to be used in the construction of railroads. The *Journal de St. Petersburg* says this brilliant result is an evidence of the immense recovery of Russian credit.

STEEL rails eighty-six and one-half feet long have been tried on German railway bridges with excellent results. The noise occasioned by the vibration of rail joints had previously been almost unendurable, but was greatly lessened by the adoption of these long rails.

THE Oregon Railway and Navigation Company has about 1,500 men employed on the construction of its road, which is to connect with the Oregon Short Line. It is expected that the two roads will be united early in the fall.

Tramways.

American Street Railway Association.

President.—William H. Hazzard, Brooklyn, N. Y.
First Vice-President.—James K. Lake, Chicago, Ill.
Second Vice-President.—George B. Kerper, Cincinnati, O.
Third Vice-President.—D. F. Longstreet, Providence, R. I.
Secretary and Treasurer.—William J. Richardson, Brooklyn, N. Y.
Office of the Association, cor. Atlantic and Third Avenues, Brooklyn, N.Y.

CROSS-TOWN TRAMWAYS IN NEW YORK CITY.

TO the cross-town tramways in this city, the introduction of the elevated roads has been a positive benefit. While to a greater or less extent nearly all of the longitudinal surface roads of New York, if such a phrase adequately expresses those roads traversing the city north and south after the manner of a meridian, have suffered a diminution of travel since the elevated structures were brought into direct opposition with their superior speed facilities, the short lines across the town from ferry to ferry have been favored with an increase of passenger traffic. The reason for this increase is obvious. Not only do these roads sustain their former traffic, but also secure the patronage of the travelers on the elevated roads whose destinations are either a North or East River ferry or points remote from the avenues of the lines. For this reason the cross-town lines, no matter what their starting point or destination, generally have selected those streets to pass through, which will enable them to cross the elevated roads at points where the latter have stations.

There are about a dozen of these cross-town tramways now running in this city, and almost without exception they yield a handsome profit to their owners. Being limited in length they are able to run their cars at short intervals, while the expense of track construction and supervision is necessarily much less than that of the longer up-town roads. If we are not mistaken, there will be a steady increase in the number of cross-town roads in New York City, for the simple reason that they have no rivalry to dread from the elevated roads which experience a reciprocal benefit in that they are enabled to improve their facilities for carrying passengers. It is of great benefit to the elevated roads that while they are of necessity limited in their stoppages, they may connect with surface lines that extend to and from all points and furnish passengers the means of crossing the town. In its greatest extent from east to west, New York City is but two and one-half miles broad; its greatest breadth being about on the line of Fourteenth street, and it is doubtful if an elevated road will ever be constructed for so short a distance. Certainly it could not adapt itself so thoroughly to the tide of travel as a cross-town tramway. From this extreme breadth of two and one-half miles, New York tapers in both directions, and the possibilities of an elevated road through more northern or southern cross-streets than Fourteenth street is still further lessened. Practically the cross-town roads have a perpetual monopoly, and the very causes that operate unfavorably upon the longitudinal roads inure to their benefit.

In view of this fact, it is a little singular that so vast a portion of the city has been neglected by the cross-town tramways. No road crosses Broadway at a point lower than Walker street, and all the territory lying east of the thoroughfare below that point has no connection with the corresponding western section. From the present quarters of the JOURNAL to any point on the North River is a distance of nearly a mile, and as yet there is no means of traversing the distance save the locomotion furnished by nature. Some years ago there was a line of stages projected, but the plan was never put into operation, and the North and East Rivers for a distance of nearly two miles on either shore are unconnected by either stage or tramcar. The Belt Line offers a method to perform this journey to those who set no value upon time, and are content to travel three miles of road to accomplish one of distance, but this line can hardly be deemed a cross-town road, nor does its mission fulfil the requirements of inter-travel between the before-mentioned sections of the city.

It is probable that the establishment of the "annex ferries" between Brooklyn and the railway termini at Hoboken, Pavonia, Jersey City and Communipaw, has in a great measure discouraged the construction of cross-town tramways between the lower North and East River ferries, but it is doubtful if the annex boats could obtain the bulk of travel between the Jersey shore and Brooklyn if a rapid and convenient cross-town line was put in operation. More especially is this to be doubted since the opening of the Brooklyn Bridge. A line of cross-town cars between the North River ferries and the Bridge, would offer greater inducements to the public to accomplish the journey from Jersey to Brooklyn than the annex boats could possibly furnish. It must also be borne in mind that the cross-town travel in the lower portion of the city is by no means confined to those persons journeying between Brooklyn and the Jersey shore. Probably this class of travelers is in the minority. Many business men have constant occasion to journey from river to river, and are now compelled to perform the task on foot. In addition, there are hundreds desirous of reaching the wharves and business houses on the East River from points in Jersey, and other hundreds in Brooklyn having frequent occasion to reach corresponding points on the North River. The annex ferries get none of this travel, and the field is open to the first stage-line or tramway that will provide the means of accomplishing these journeys without the fatigue of walking, or the necessity of submitting to the extortionate demands of hackmen.

The chief difficulty in the way of the successful operation of a cross-town tramway in lower New York City is the problem of crossing Broadway. The travel in this thoroughfare is so great that a line of cars crossing it at any of the streets between Wall and Canal streets would seriously impede traffic, and in turn be seriously impeded thereby. It is doubtful if a charter could be obtained for such a road, especially were it designed to cross Broadway at streets near the City Hall.

This is a serious objection, but not insurmountable. There is no reason why the line could not cross the main artery of city travel either by means of a bridge or a tunnel. Possibly the tunnel might interfere with the contemplated Broadway tunnel, but this latter project is so laggard that we are inclined to doubt its ultimate consummation. The crossing of Broadway on a bridge is a more difficult undertaking, and we incline to the tunnel. New York City may be likened to a huge leviathan reposing on the waters of the harbor. Broadway may then be said to define the spine of the animal, and from it the rib-like streets decline toward the water on either side. Striking in a block midway between Church street on the west side, and William street on the east, a line of tramcars could easily cross Broadway in a tunnel, with very slight deviation and deflection. Such a road would necessarily be expensive in construction but not in maintenance, and its patronage by the traveling public would be very great. Certainly there is need for a cross-town tramway in lower New York City, and if such a road cannot cross Broadway on a level, it must do so either by means of a bridge or a tunnel. A tunnel appears to us the more feasible, and the idea is certainly deserving of consideration by tramway managers.

CABLE RAILROADS.

BY W. W. HANSCOM, M. E.

(Written for the AMERICAN RAILROAD JOURNAL.)

THE system of propulsion of street cars by a cable traveling in an underground slotted tube, having been in operation in San Francisco nearly eleven years, and within the past two years having been put into use in Chicago and Philadelphia, it has brought the subject into prominence, especially as the question of its adaptability has been discussed with reference to its employment in the Eastern cities and towns. The use so far having been principally confined to San Francisco and Chicago, it seemed that some information concerning its more important features, as developed by the experience of the cable roads in San Francisco, would be appreciated by the readers of the JOURNAL. In view of this, it is proposed to give some details of the construction of some of the cable roads in the before-mentioned city, with some of the conditions under which they are operated.

The first cable road constructed in San Francisco was up Clay street Hill, which was considered to be the best adapted to the experiment. This street, from its location and grade, was more free from traffic by teams than many other streets, and the population along its vicinity gave some assurance of patronage, as it was a steep hill to climb, thereby encouraging the residents to patronize a railway which would safely, promptly and rapidly take them to their homes. There being only light vehicles passing over most of the route, the substructure or tube and railway could be made much lighter than if placed on streets frequented by heavy trucks. The question of cost was also an important consideration, as a large part of the capital necessary for the construction of the road was subscribed by people who lived or owned property along the proposed line, and some by the friends of the projectors who were willing to risk some money in the scheme.

The tube for this road was constructed mostly of wood, cast iron only being used in the construction of ribs or skeletons, called yokes or frames, which were made in the shape or form of the tube, with recesses, into which were placed the planks forming the bottom, sides and top of the tube. The part which formed the slot or opening into the top of the tube was made of wood scantling laid along on the cast iron frames and fastened to them. Strap iron was laid along on the top of these scantlings so that the edges of the iron would project slightly over the slot at the sides and prevent the abrasion of the wood by the shank of the grip when passing. Wood being the cheapest material, it was freely used in order that the greatest economy might be exercised in construction; for until it was started and fairly in operation carrying passengers, many even among those who had subscribed the necessary funds were doubtful about its success. But when it had been in operation for a few weeks, doubt was dispelled, and the enterprise passed from an experiment into the domain of an assured practical success. About five years after the road commenced operations, it was decided to extend it, adding about one-third or three-fifths of a mile to its original length. Changes were made in the driving machinery, in the engines, and in the manner of conducting the cable from the street to the engine house, and back again to the street.

The speed of the cable at this time was about three and three-quarter miles per hour, which was increased to about four miles until the extension of the road was made in 1878, when the speed was further increased to six miles per hour, at which it remains.

The cars are light, weighing about 2,800 pounds each, and the dummy the same. The cars seat fourteen persons and the dummies seat sixteen. The gauge of the track is three feet six inches. The cable used is three inches in circumference, and is composed of six strands of nineteen wires each, the six strands surrounding a core or heart of hemp. The wires are of crucible steel .062 of an inch in diameter, and are tested to a breaking strain of 160,000 pounds per square inch of sectional area, and must possess sufficient toughness to be bent a complete circle around a wire of its own diameter, unbent, and bent round again, and again unbent without breaking. The cable is made in one piece, so that only one splice is made in the rope, the length required for the splice being 100 feet. The length of the cable now in use is about 11,000 feet.

When the road was extended in 1878, the tube was made of iron and concrete, wood only being used for covering.

Cast iron frames were made of sufficient height and width to reach from the surface of the street to some eight or nine inches below the bottom of the tube, and to reach from rail to rail, chairs being formed in the castings into which the flange of the rail sits, and is held in place by bolts going down beside the flange and through the chair. Suitable projections were formed at the center of the top of the frame for supporting the channel irons which form the slot. These castings are placed along the road about three feet apart, in a suitable trench, and the rails and channel irons which form the slot are fastened to them, after which the castings are leveled and straightened, and wood skeletons are laid from one casting to another, which are of the shape of the bottom and sides of the tube. Concrete is then filled around them to the thickness of six or eight inches, and when set sufficiently, the skeleton is removed to another place and the operation repeated.

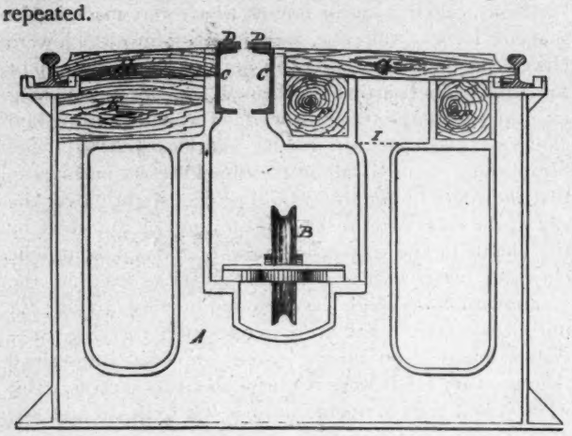


FIG. 1.

Fig. 1 shows one of the castings or frames with a section of the rails and channel irons forming the slot, or slot irons as they are now called. A is the casting formed of a flanged web, having three openings through it, one wide one in the center and a narrow one on each side, the center one being the outline of the tube, which is formed of concrete between one casting and another. The side openings admit of the concrete meeting and uniting, forming a monolithic structure the length of the tube constructed. B is the carrier sheave which carries the cable, and these are usually placed about thirty feet apart, having openings or hatches above them for access to remove or oil their bearings. C C are the channel irons forming the slot, and which are bolted to proper flanges on the frame A. D D are irons bolted to the top of the slot irons, the holes through which the bolts pass being somewhat larger sideways than the bolt, so that the irons can be brought nearer together or placed further apart to regulate the width of the slot. It is also intended whenever necessary to take off these irons D D, the openings below them being a little more than an inch wide, so that the rope or cable may be taken up at any point of the road. E and F F are sills which support the planks G H, which form the paving of the street, the top of the concrete being at I. This form of frame of cast iron makes a firm tie between rails, and also confines the rails and slot irons so that one cannot move without the other; this is necessary, as the shank of the grip which passes downward from the car through the slot and into the tube should be kept as near the center of the slot as practicable, on account of the friction and wear which would occur if the shank was pressed to one side or the other by the track or rails moving away from the slot on either side. It will be noticed that the slot is placed on one side of the center between the rails, while the carrier sheave B, which supports the rope, is in the center. The slot is placed on one side of the center for this reason.

On Clay street, as well as other streets in San Francisco, the crossings are level, no matter what may be the grade of the streets on either side of them, and where steep grades occur as on Clay and other streets, a sharp angle is formed at the crossings; now at this point, when the street takes a sharp grade up, the cable in the tube would, by the strain put upon it, be hauled up against the upper side of the tube, consequently an inverted carrier sheave is placed at this point to keep the cable from rubbing against the top of the tube. These inverted carrier sheaves are called "depression" pullies or sheaves.

Whatever gripping apparatus is used, the shank which comes through the slot must run on one side of the depression pulley, and the part of the grip which takes hold of the rope or cable must pass above the lower and below the upper sheaves. Fig. 2 is a sectional view of the part of the grip which is in the tube, and which takes hold of the rope. A is the shank, having the foot B at right angles, and on which slide the two jaws C C, which grasp the cable, and are separated or brought together by the wedge D, which is raised and lowered by the slide E, to which is at-

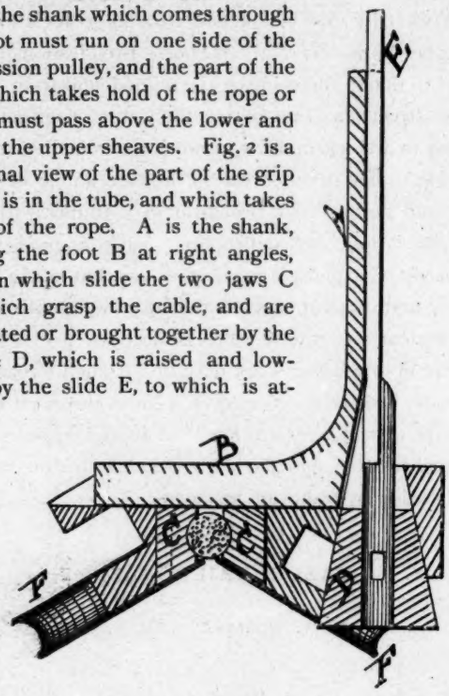


FIG. 2.

tached at its upper end on the dummy a screw on which works a nut operated by a hand wheel. It will be seen that if sheaves are situated directly above and below each other and in line with the jaws of the grip where the rope passes, the grip could pass between them if they were separated a little more than the vertical thickness of the grip at this point. This construction of grip, by which the jaw is located on one side of the shank, requires the slot to be out of line with the rope, so that as the cable is placed centrally between the rails, the slot requires to be placed out of center.

The shank of this grip is a bar about seven inches by seven-eighths of an inch in thickness, and extends downward from the dummy through the slot and into the tube, that part of the shank which in use is at the slot, being made somewhat thinner, so that there may be no pinch-

ing or binding between the edges of the irons forming the slot which, at the surface of the street is usually made three-quarters of an inch wide. It is sufficiently narrow to prevent any buggy wheel from dropping into it when passing above it. As before stated, this shank, which projects from the dummy into the tube, has a foot projecting at right angles from its lower end; this foot having the edges beveled off so that a frame (in which is fastened the jaw C, farthest from the upright portion of the shank) may slide. Within this frame is a short bar, also arranged to slide on the foot of the shank, and having fastened to it one of the jaws C, which is nearest to the upright part of the shank. Between this latter bar and the frame carrying the first-named jaw, is placed the wedge D. This wedge, with its base downward, is caused to act on the two jaws by drawing it upward and thus bringing the jaws nearer together, clamping the rope between them with any degree of force requisite. This wedge is drawn up and lowered by means of the slide E, which is a flat steel bar about three-eighths of an inch thick and two inches wide for a portion of its length, the upper part terminating in a round rod having a thread on it which passes through a nut operated by a hand wheel. This hand wheel being supported on the top of a hollow screw which is arranged to raise and lower the whole grip bodily when picking up the cable preparatory to starting on a trip. The relative movement of the rim of the hand wheel to the jaws which take hold of the rope is about five hundred to one, which has been found ample to take the cars over the steepest grades with their heaviest loads, sometimes consisting of seventy passengers.

(To be continued.)

A New Tramway Locomotive.

IN a recent issue, *Engineering* illustrates and describes a new tramway locomotive, designed by N. Scott Russell, a well-known engineer.

The small engine exhibits some novel features. The boiler shell is welded in one piece. The cylinders and valve motion are of an ordinary high-pressure pattern, but the steam is exhausted into a surface air condenser composed of 250 very thin copper tubes fixed in thin cast brass chambers. From this condenser any steam remaining uncondensed passes to a water tank in the front end of the engine, or into the smoke box, where it passes out free from noise. The speed regulating and brake mechanism are particularly effective, these matters having received special attention, to enable the tramway car to be operated safely on steep grades. A supplementary wheel placed between the drivers, and running on the rail, operates a speed governor and restrains the car velocity below ten miles an hour. All the machinery is carefully enveloped in casing, to exclude dust and grit from the wearing surfaces.

Tramways in Great Britain and Ireland.

THE total length of the street railways, or tramways, in England, Scotland and Ireland, is 669.6 miles, according to the last official report, of June 30, 1883. The total cost of construction was $48,750,000, including the rolling-stock and equipment of all kinds. The 141 lines are worked with 20,122 horses, 117 locomotives and 2,819 cars.

The Market Street Cable Road in Philadelphia.

PRESIDENT Widener, of the West Philadelphia Passenger Railway Company, appeared recently before the Railroad Committee of Councils, of Philadelphia, which met to consider the bill by which it was proposed to give the Market Street Line exclusive right to the north side of the Schuylkill River bridge. The power of Councils to grant such a right was questioned, and the matter was postponed until the Finance Committee had disposed of the new bridge project. Mr. Widener said that no exclusive right was asked over the new or temporary bridge. Said he: "We can't lay our tubing for the cable road over the bridge, and we propose to run the wheels over the floor of the structure, and in doing so it practically gives the company the exclusive use of the bridge, for nothing else could be driven over it. What we ask is only a temporary matter." With Mr. Widener's concurrence the word "exclusive" was stricken out. He said that what the company wanted was to have the cable road in operation in time for the opening of the Electrical Exhibition.

A Skidless Tram Rail.

WHEN the level of the roadway wears down below the level of the tramway rail, vehicles are very apt to jolt and skid when crossing the line of the rail. The effect is discomfort; wear and tear of carriages and horses is considerable, besides the great current expense to tramway companies and corporations in keeping the level of the roadway up to that of the rail. A new rail is designed to obviate these drawbacks, and, in addition, permit of rapid laying and relaying. The skidding of vehicles, when the roadway has sunk, is prevented by scolloping or inching the edge of the rail. The track for the tire of the wheels is as in ordinary rails, but the rail is fastened, at the ends of every length, to a longitudinal sleeper laid beneath it, by means of screws. These screws readily admit of the rail being tightened on its bed by means of a key, or of lifting and renewing the rail when the street has to be repaired or the rail is worn out. The improvement is English.

THE electric railway running from the Brighton, England, Aquarium about a mile along the Madeira-road, has been in successful operation over about 1,000 yards of its length for some months. During the Easter holidays it was most enthusiastically supported by the Brighton residents and the visitors, and it is in every way clear that the line will be looked upon by everyone, not only as an attraction, but as of very great convenience.

THE People's Horse-Car Railway Company, of Chicago, Ill., has been incorporated with a capital stock of $200,000. It will construct and operate a tramway from the corner of West Lake and Fortieth streets to Maywood on Lake street, and will also have lines on Waller street and Oak Park Avenue.

THE articles of incorporation of the Brooklyn Elevated road have been filed in Albany. The $1,250,000 bond loan has all been subscribed for. They were placed at $600 on each $1,000, with $1,000 worth of stock thrown in as a bonus. Work on York street will be pushed as rapidly as practicable.

New Inventions.

Automatic Gate for Railroad Crossings, Private Residences, Etc.

LAWRENCE C. WALSH, Webster, Massachusetts, has invented a gate for use at railroad crossings, and equally well as a private gate for residences. In the former case it can be operated by the locomotive, or by hand if desired; in the latter, the gate is so made that the weight of a horse and wagon will lift it. In the case of very wide railroad crossings, the inventor proposes the use of a double gate, parted in the middle, and to swing or run to each side of the road. His patent covers both the uses, and also the modification indicated.

The qualities which the inventor claims for his gate are cheapness, reliability, simplicity and labor saving. Its peculiarities of construction comprise a latch to hold up the pivoted track. A wire runs from this latch about eight hundred feet each way from the gate, on posts. The approach of the locomotive operates automatically to open the gate. To work it by hand, all that is needed is one wire attached to the loose end of the pivoted track and carried on posts to any easy distance. It is often seen that roads cross the track quite near country depots. In these cases, a wire could be made to run into the depot and the gate opened without the necessity of the man in charge of the matter, getting up from his seat. Gates after Mr. Walsh's plan of construction, can be built for forty or fifty dollars each, first cost.

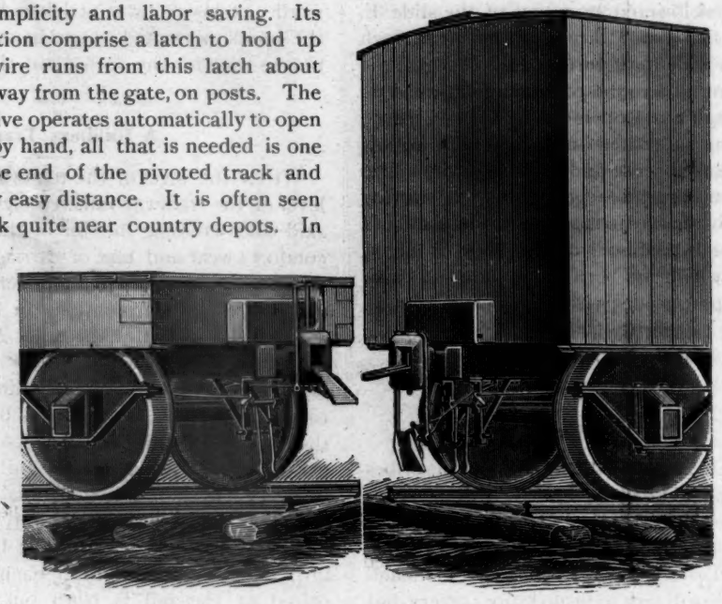
Unlike any device of the kind, so far as we are informed on the subject, the Walsh invention is unique in that nothing runs on the ground in connection with it. It provides a rail on the cab of the locomotive. The operation of this rail in connection with the rest of the apparatus before described is easily understood. As the locomotive approaches the gate, the rail on its cab touches the wire on the posts and thereby drops the track on which the gates run, thus causing the gate to close. When the locomotive reaches a lever arm at the gate, the gate is raised on the latch, leaving the road open for teams to pass. A second lever arm is provided which hangs down after the locomotive has passed. It is useful in case the train should stop and reverse its direction. Then it would be touched in such a manner by the passing locomotive, that it would automatically close the gate.

The J. C. Bryan Automatic Car-coupling.

IN using this coupling, there is no change to be made in the construction of the cars, draw-head, or link, and but a slight change in the coupling-pin. The coupling can be attached to the cars now in use without the removal of, or in any way interfering with the buffers or any part of them.

This attachment is durable and reliable at any and all times, on a straight or curved track. Each car is provided with three levers only, one on each side and one extending to the top, by which either or both ends of the car may be uncoupled by any one of the three levers.

When necessary, the coupling at one or both ends of the car can be locked to prevent the cars from coupling —all done at the ends of the levers. The levers, except the one extending to the top, work under the bottom of the car, and are never in the way nor liable to be broken. With this attachment cars can be uncoupled while running at any rate of speed or while standing. The cars make their own coupling when run together. Couplings can be made automatically with cars of different heights, and cars will always couple automatically where it is possible to couple them at all.



THE J. C. BRYAN AUTOMATIC CAR-COUPLING.

Another advantage is conspicuous in the fact that cars without this attachment will, when the link is left in them, couple automatically with cars that have the attachment.

The engraving is explanatory of itself. The link strikes the apron-guide, the apron throws the link into the opening of the draw-head, and the impact of the link against a trip-plate working in the throat of the draw-head, causes the coupling-pin, lifting frame, and apron-guide to fall, thus coupling the cars.

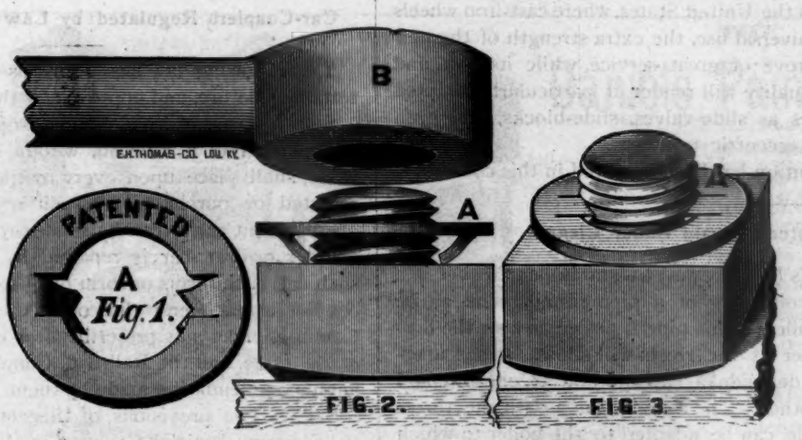
This attachment is the result of eleven years' constant study; experiments having been made with hundreds of models before trying it on the cars. It is the invention and patent of John C. Bryan, Holly Springs, Ark.

The Van Dusen Patent Nut-lock.

THE following cut and explanation give a good idea of a very simple and efficient nut-lock, patented by Mr. Chas. Van Dusen, of New Albany, Ind. It differs from any nut-lock heretofore invented in the way it attacks the difficulties to be overcome.

The opposition to the removal of the nut, instead of coming from below or to one side of it, as in most other nut-locks, comes in this case from the point where it would seem natural that such opposition should come, viz.: from outside the nut.

As the lock is driven flat upon the nut, as described in the diagram, and the tongues straighten out into the same plane as the lock, the teeth are forced into the body of the bolt, making a positive and secure fastening, such as is made by no other nut-lock. Although holding so firmly, this lock is quite easily removed, it being only



THE VAN DUSEN PATENT NUT-LOCK.

Fig. 1.—A, represents nut-lock detached. Fig. 2.—A, nut-lock in position ready to apply; B, the tool used in setting the lock—it is simply a bar of iron having a hole ½ inch larger than the bolt—when placed as indicated, one or two smart blows with a hammer on the tool force the lock flat. Fig. 3.—A, represents the lock applied.

necessary to lift each shoulder slightly by any tool forced between it and the nut, when the lock comes off without having occasioned the least injury to the bolt.

This nut-lock has to be made of the best quality of steel; and while its action is positive and certain, making it a perfect nut-lock, yet it can be made and sold cheaper than even jamb-nuts or wooden washers. These nut-locks have been severely tested, one of the tests being their use for some months upon the "rattlers" used for cleaning castings in large foundries, where even jamb-nuts were inefficient, yet of these locks none have been started.

The patents have been purchased by the Peerless Manufacturing Co., of Louisville, Ky., who have already made adequate arrangements for the manufacture and sale of these nut-locks in large quantities, and will furnish samples upon applicatiou.

Malleable Castings.

THE firm of Jenkins, Law & Price, Melbourne, Victoria, have invented a system of making malleable castings. Articles required, having been first cast in "chill" molds in the usual manner, are then subjected to a heat of particular temperature and immersed in a bath containing an admixture of certain ingredients. Upon examination of the metal thus treated it is found to possess a beautiful soft, bluish tint, and to be entirely free from that hard scale characteristic of metal cast in the sand, while upon fracture the grain is discovered to be of a close, but soft and remarkably homogeneous texture, and to possess the dull gray color distinctive of steel.

In a paper recently read before the Victorian Chamber of Manufactures, Melbourne, A. P. Greaves said:

"Numerous experiments have been made with a view of ascertaining the susceptibility of the patent metal to the action of tools, and nothing could better demonstrate its wonderful softness and homogeneity of substance than the fact that a one-sixteenth inch twist-drill was, with perfect ease and without injury to the tool, driven half an inch into one of the bars; while, submitted to the action of a one-fourth inch punch, a plate three-sixteenths inch thick was punched several times, within an inch of the edge, without showing the slightest sign of fracture. Further experiments made with taps and dies showed that both male and female threads of very unusual completeness for cast iron could be made in this metal. Then, as to its behavior under the action of the lathe, it cannot only be turned at a 'brass speed,' but works up under the tool into a smooth, even surface, the metal at the same time coming away from the edge in fine curved shavings, instead of the usual coarse, brittle dust.

"In connection with the use of chill molds, it might at first sight appear that the expense of procuring the same would be an objection to the use of the newly patented method, but this idea will immediately disappear when it is pointed out that the new process effects a material saving in no less than the following six different directions: (1.) Economy of space. It will be at once evident that, with the use of chill molds, one corner of a shop will be sufficient to execute a job that, by requiring a whole host of sand patterns, might under the old plan occupy half the building. (2.) Reduction of plant in such articles as molding boxes, molders' tools, and so forth. (3.) Reduction of labor. This follows so self-evidently upon the preceding item as to require no further explanation. (4.) Rapidity of production. It is almost super-

fluous to point out that with the use of the "chill" mold castings can be produced at a speed of at least ten times what was possible by the old, tedious method of sand casting. (5.) Saving in material, through the great increase of strength in the same. To make this clear it is only necessary to take the case, for instance, of a bracket which, in order to sustain a weight of, say, one ton, has hitherto required to be of a certain bulk, but which now, by reason of a large increase in the strength of the material can, of course, be reduced in thickness to an exactly proportionate extent. (6.) Saving in cost of tools. The economy in this direction may not at first appear very evident, but a little reflection will show—especially to those whose particular line necessitates a heavy expenditure on the item of files for fettling and trimming purposes—that the absence of the hard scale found in ordinary sand castings must result in a very considerable reduction of outlay in the direction pointed out.

"Especially in the United States, where cast-iron wheels are in almost universal use, the extra strength of the new material will prove of great service, while its soft and homogeneous quality will render it particularly adapted for such articles as slide-valves, slide-blocks, and even valve-seats and eccentric tumblers."

The new invention has been patented in this country.

Foster's Steam Boiler Cleaner.

J. H. FOSTER'S (Era, Texas,) Steam Boiler Cleaner is a simple device, consisting of a pipe running the entire length of the boiler. This pipe is placed as near the bottom of the boiler as the rivets will allow. It has apertures on its under side, a cup and bolt at one end, and bushing at the other. The outer fixtures, with the throttle or other value, can be adapted to the boiler to which they are applied. It does not matter at which end of the boiler the valve opening is placed. The inventor considers that one pipe is all that is necessary in fitting small boilers with his improvement, but large ones may require two or three, either connected with the same outlet or having each a separate one. In this case the area of all the holes should not exceed that of the valve opening. The upper pipe should be placed about one-half inch above the water line, so that when the valve is opened the foam is sucked through the small holes and thrown out, and in like manner the mud unloaded from the bottom. The valve should be blown for the space of a quarter of a minute three or four times a day. This is no more trouble than to try a gauge cock. Mr. Foster suggests that for railroad use, or in long boilers in which the valve might be in the way, it would be best to connect the pipes in the middle of the boiler by a tie, and attach a curved pipe to the tie, adapted in form to the circumference of the boiler. This pipe should lead out at the top of the boiler, with bushing and fixtures as before described. One advantage of this plan of connection is, that it entirely obviates injury from freezing.

The advantages claimed for the device we have described are its simplicity, placing, as it were, a blow-off cock at every six inches of the boiler's length; its cheapness, ease of application, its being automatic in operation, never requiring to stop or empty the boiler in order to clean it, its durability, and its being placed inside the boiler and so out of the way.

A Safety Truck Lock.

A NEW appliance for insuring greater safety in case of railway accidents was tested on the Canadian Pacific track at Hochelaga, recently. The invention, known as the Wilson Safety Truck Lock, is intended to prevent cars, in case of being thrown off from the track, from slewing around and running down an embankment. It was tested on freight car No. 2,300, on a sharp curve, the track being broken so as to derail the car when going at a speed of fifteen or twenty miles an hour. The car simply bumped along on the ties for forty or fifty feet, and then came to a standstill, none of the wheels being more than thirty inches from the rail it had left. Mr. Baker, superintendent, Mr. Shaughnessy, assistant manager of the Canadian Pacific, and other railway and public men who were present, expressed themselves well satisfied with the test.

Car-Couplers Regulated by Law in Massachusetts.

THE following law has been passed by the Massachusetts Legislature, and approved by the Governor:

SEC. 1. Every railroad company operating a railroad, or any portion of a railroad, wholly or partly within the State, shall place upon every freight car hereafter constructed or purchased by such corporation, and upon every freight car owned by such corporation of which the coupler or draw-bar is repaired by it, with intent to use such car, such forms or form of automatic or other safety coupler at each end thereof as the Board of Railroad Commissioners may prescribe after examination and test of the same, and the Railroad Commissioners may annul any recommendation made by them.

SEC. 2. The provisions of this act may be enforced by the Supreme Judicial Court on application of the Attorney-General.

SEC. 3. So much of this act as relates to the examination and test shall take effect on its passage, and the same shall take full effect on the first day of March next.

The following circular, dated Boston, May 15, has been issued by the Massachusetts Railroad Commission:

By an act of the Legislature, approved May 8, 1884, all new freight cars owned by Massachusetts railroad companies are, after March 1, 1885, to be equipped with automatic or other safety couplers, approved by this Board, after examination and test thereof.

The Commissioners will, on Sept. 25 next, hear at their office, No. 20 Beacon street, Boston, all parties desiring to set forth the merits of any safety coupler, and also any criticisms thereof by experts, and they will witness tests of such devices to be made in or near the city of Boston. The hearing will begin at 10 o'clock, A. M. Records of the working of safety couplers in actual use for traffic are especially desirable.

THE organ of the "Order of Railway Conductors," published at Elmira, New York, is a monthly with a useful mission. Its contents, outside of those immediately appertaining to the business of the association, are of the right sort to entertain and edify the readers for whom they are specially prepared. The spirit and feeling of the *Railway Conductors' Monthly* are very praiseworthy, and its appearance is a recommendation. We cordially hope

Prominent Locomotive and Car Builders.

Adrian Car Works, Adrian, Mich.
W. C. Allison, Junction Car Works and Flue Mill, Philadelphia, Pa.
Altoona Car Works, Altoona, Pa.
Atlanta Machine Works, Atlanta, Ga.
Baldwin Locomotive Works: Burnham, Perry, Williams & Co., Phila., Pa.
Barney & Smith Manufacturing Co., Dayton, Ohio.
Beaver Falls Car Co., Beaver Falls, Pa.
Osgood Bradley, Worcester, Mass.
J. G. Brill & Co., Philadelphia, Pa.
Brooks Locomotive Works, Dunkirk, N. Y.
Brownell & Wight Car Co., St. Louis, Mo.
M. M. Buck & Co., St. Louis, Mo.
Erie Car Works, Erie, Pa.
Gilbert & Bush Co., Troy, N. Y.
Harlan & Hollingsworth Co., Wilmington, Del.
Haskell & Barker Car Co., Michigan City, Mich
Hazelton Car Works, Hazelton, Pa.
Indianapolis Car and Manufacturing Co., Indianapolis, Ind.
Jackson & Sharp Company, Wilmington, Del.
Jones Car Manufacturing Co., Schenectady, N. Y.
Keith Manufacturing Co., West Sandwich, Mass.
Kingston Car Works Co., Kingston, Canada.
Laconia Car Co., Laconia, N. H.
Lima Car Co., Lima, Ohio.
Wm. Mason & Co., Taunton, Mass.
Mansfield Machine Works, Mansfield, Ohio.
Muskegon Car and Engine Works, Muskegon, Mich.
Ohio Falls Car Co., Jefferson, Ind.
Pardee Car Works, Watsontown, Penn.
Portland Locomotive Works, Portland, Maine.
Pullman Car Co., Pullman, Ill.
Rogers Locomotive and Machine Works, Paterson, N. J.
Schenectady Locomotive Works, Schenectady, N. Y.
The John Stephenson Co. (Lim.), New York City.
Taunton Locomotive Works, Taunton, Mass.

Prominent Car Wheel Manufacturers.

Allen Paper Car Wheel Company, Chicago, Illinois.
Barney & Smith Manufacturing Company, Dayton, Ohio.
Boston Standard Wheel Company, Boston, Massachusetts.
Cleveland Bridge and Car Works, Cleveland, Ohio.
Dickson Manufacturing Company, Scranton, Pennsylvania.
Ensign Manufacturing Company, Huntington, West Virginia.
Fargo Car Wheel and Iron Works Company, Fargo, Dakota.
Gartshare Car Wheel Manufacturing Company, Toronto, Canada.
Harrisburg Car Manufacturing Company, Harrisburg, Pennsylvania.
Indianapolis Car and Manufacturing Company, Indianapolis, Indiana.
Jersey City Wheel Foundry and Machine Works, Jersey City, New Jersey.
Knoxville Car Wheel Company, Knoxville, Tennessee.
Louisville Car Wheel and Railway Supply Company, Louisville, Kentucky.
Marshall Car and Foundry Company, Marshall, Texas.
Nashua Iron and Steel Company, Nashua, New Hampshire.
Ohio Falls Car Company, Jeffersonville, Indiana.
Paige Car Wheel Company, Springfield, Ohio.
Ramapo Wheel and Foundry Company, Ramapo, New York.
St. Charles Manufacturing Company, St. Charles, Missouri.
Tredegar Iron Company, Richmond, Virginia.